GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00002, REVISION 3

INSERVICE INSPECTION
OF PRESSURE RETAINING WELD IN SCRAM DISCHARGE VOLUME PIPING

I. Component:

An inaccessible portion of weld No. 91 on the scram discharge volume piping (12" EBB line) is located in the Control Rod Drive Hydraulic (C11) System. (See the attached sketch.)

II. Code:

The subject pressure retaining piping weld was designed and fabricated to ASME Section III, Class 2 requirements. Applicable inservice inspections are to be performed in accordance with ASME Section XI, 1977 Edition through and including Summer 1979 Addenda.

III. Code requirements:

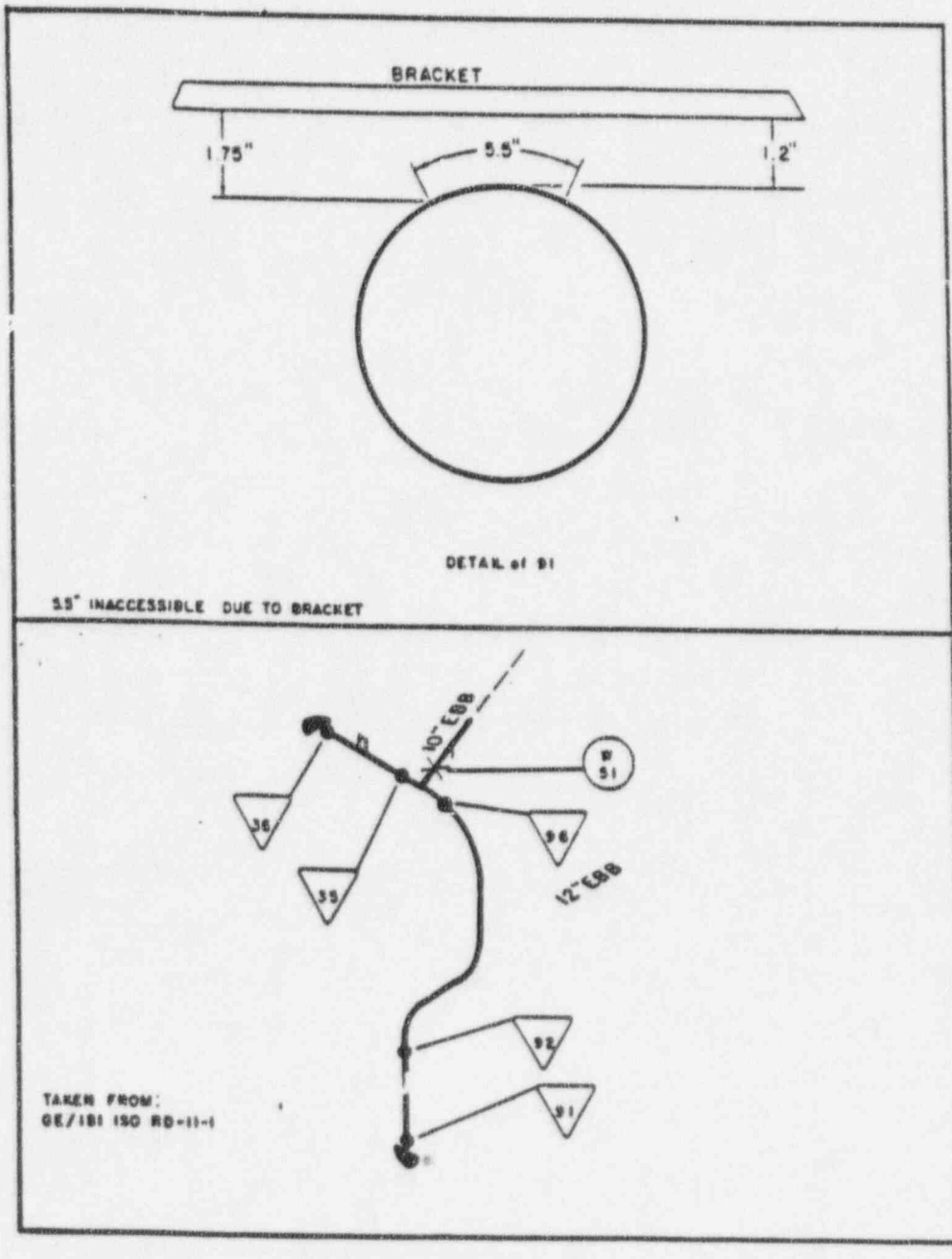
Class 2 pressure retaining piping welds are required to be volumetrically and surface examined once ever ten-year interval in accordance with ASME Section XI, Table IWC-2500-1, Category C-F.

IV. Information to support the determination that the code requirements are impractical:

The installation of a bracket directly above the circumferential weld No. 91 has limited the accessibility to the weld for unltrasonic examination. The inaccessible portion of the weld is approximately 5.5 inches of the circumference of the 12 inch NPS pipe, or 14 percent of the weld length.

V. Specific relief requested:

Permission is requested to delete the requirement to volumetrically examine the portion of weld No. 91 inaccessible due to the installed bracket.


BRACKET
1.75"
5.5"
1.2"
DETAIL of 91
5.5" INACCESSIBLE DUE TO BRACKET
10" ERB
12" ERB
91
92
93
94
95
96
TAKEN FROM:
GE/IBI ISO RD-11-1

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-0004, REVISION 3

INSERVICE INSPECTION
RPV LOWER HEAD-TO-SHELL WELD A-A

DELETED

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-0005, REVISION 2

INSERVICE INSPECTION
RPV SEAM WELD A-B LOWER HALF

DELETED

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-0006, REVISION 3

INSERVICE INSPECTION
RPV SEAM WELD A-C

DELETED

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-0007, REVISION 2

INSERVICE INSPECTION OF
PIPING WELDS WITHIN GUARD PIPES

I. Component:

ASME Section III, Class 1 pressure retaining circumferential welds located in Feedwater Loops A and B (B21), Main Steam (B21), Reactor Core Isolation Cooling (E51), Residual Heat Removal (E12), and Reactor Water Clean-up (G33) piping. These welds are located on system piping inside guard pipes, which extend beyond the containment. The applicable welds are listed in Table 1.

II. Code:

These welds were designed and fabricated to ASME Section III, Class 1 requirements. Applicable inservice inspection is to be performed in accordance with ASME Section XI, 1977 Edition through and including Summer of 1979 Addenda.

III. Code requirements:

Class 1 pressure retaining piping welds are required to be volumetrically and surface examined once each ten year inspection interval in accordance with ASME Section XI, Table IWB-2500-1, Examination Category B-J.

IV. Information to support the determination that the code requirements are impractical:

The circumferential welds joining the flued head and the process pipe are encapsulated by the portion of the guard pipe which protrudes beyond the containment. To comply with the inservice inspection requirements of ASME Section XI, two 4" × 6" elliptical access ports spaced 180° apart are provided for access to the welds. During the development of the access port design, the inservice contractor had indicated that the ports were adequate to permit performance of surface and ultrasonic examination of the entire weld.

After fabrication and installation of the process pipe, guard pipe, and flued head, it was determined that the entire length of the weld is not accessible through the two access ports.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00002, REVISION 3

INSERVICE INSPECTION
OF PRESSURE RETAINING WELD IN SCRAM DISCHARGE VOLUME PIPING

VI. Reasons why relief should be granted:

Request for exemption from inservice volumetric (ultrasonics) examination of the inaccessible portion of this weld should be granted for the following reasons:

1. This weld was examined by radiography and passed in accordance with ASME Section III, Class 2 requirements.

2. This weld was surface examined (liquid penetrant) and passed in accordance with ASME Section XI, Table IWC-2500-1, Category C-F requirements.

3. The accessible portion of this weld was volumetrically examined using ultrasonic techniques and passed in accordance with ASME Section XI, Table IWC-2500-1 requirements.

4. This weld has been hydrostatically tested in accordance with ASME Section III, Class 2 requirements.

5. This weld will be subject to pressure testing in accordance with the requirements of ASME Section XI, Table IWC-2500-1 and ASME Section XI Code Case N-498-1.

6. The portion of this weld inaccessible for volumetric examination will be surface examined each inspection interval in accordance with ASME Section XI, Table IWC-2500-1, Category C-F requirements.

VII. Alternative testing:

The accessible portion of the weld will be volumetrically and surface examined each inspection interval in accordance with ASME Section XI, Table IWC-2500-1. Should indications be found, an engineering evaluation will be made to determine if the inaccessible portion of the weld has been affected. The inaccessible portion of this weld represents approximately 14 percent of the total weld length.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-0007, REVISION 2

INSERVICE INSPECTION OF
PIPING WELDS WITHIN GUARD PIPES

V. Specific relief requested:

Permission is requested to perform ultrasonic examination of the welds listed in Table 1 to the extent possible through the 4" × 6" access ports. Also, permission is requested to perform the code-required surface examinations on the same welds to the extent possible through the access ports. The percentage of each weld examined will be recorded during the inservice examination.

VI. Reasons why relief should be granted:

Exemption is requested for the inservice inspection of inaccessible portions of welds located inside guard pipes for the following reasons:

1. All but one of these lines were designed to high energy pipe break criteria. The exception is Q1E12G012W47 which is classified as moderate energy pipe.

2. These welds were designed and fabricated in accordance with ASME Section III, Class 1 requirements and were examined by radiographic and liquid penetrant techniques.

3. These welds have satisfactorily passed both liquid penetrant and ultrasonic examinations in accordance with ASME Section XI, Class 1 requirements (preservice relief request no. 00001).

4. Class 1 isolation valves in the process pipe on both sides of the guard pipes are capable of completely isolating each pipe in the event of a pipe failure.

5. The guard pipes have been designed and constructed in accordance with ASME Section III, Class 2 requirements and were hydrostatically tested in accordance with ASME Section III, Class 2 requirements.

6. The guard pipes are open to the drywell environment; thus, any leakage due to weld failure will be contained within the drywell. The guard pipes will prevent any leakage from escaping to the Containment Building.

7. The process pipes inside the guard pipes were hydrostatically tested in accordance with ASME Section III, Class 1 requirements.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-0007, REVISION 2

INSERVICE INSPECTION OF
PIPING WELDS WITHIN GUARD PIPES

8. The process piping inside each guard pipe assembly will be subject to pressure testing in accordance with ASME Section XI, Table IWB-2500-1 and ASME Section XI Code Case N-498-1.

VII. Alternative testing:

The accessible length of each weld will be ultrasonically and surface examined in accordance with ASME Section XI, Table IWB-2500-1, Examination Category B-J. Should signs of weld deterioration or discrepancies be noted during regular inspections, evaluation of the conditions will be made.

Note: In addition, a relief request (No. 00001) based on the above logic for four (4) welds on main steam pipes was submitted earlier with the Unit 1 preservice inspection. The Nuclear Regulatory Commision accepted this request for relief in GGNS Safety Evaluation Report, Supplement #2.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-0007, REVISION 2

TABLE 1

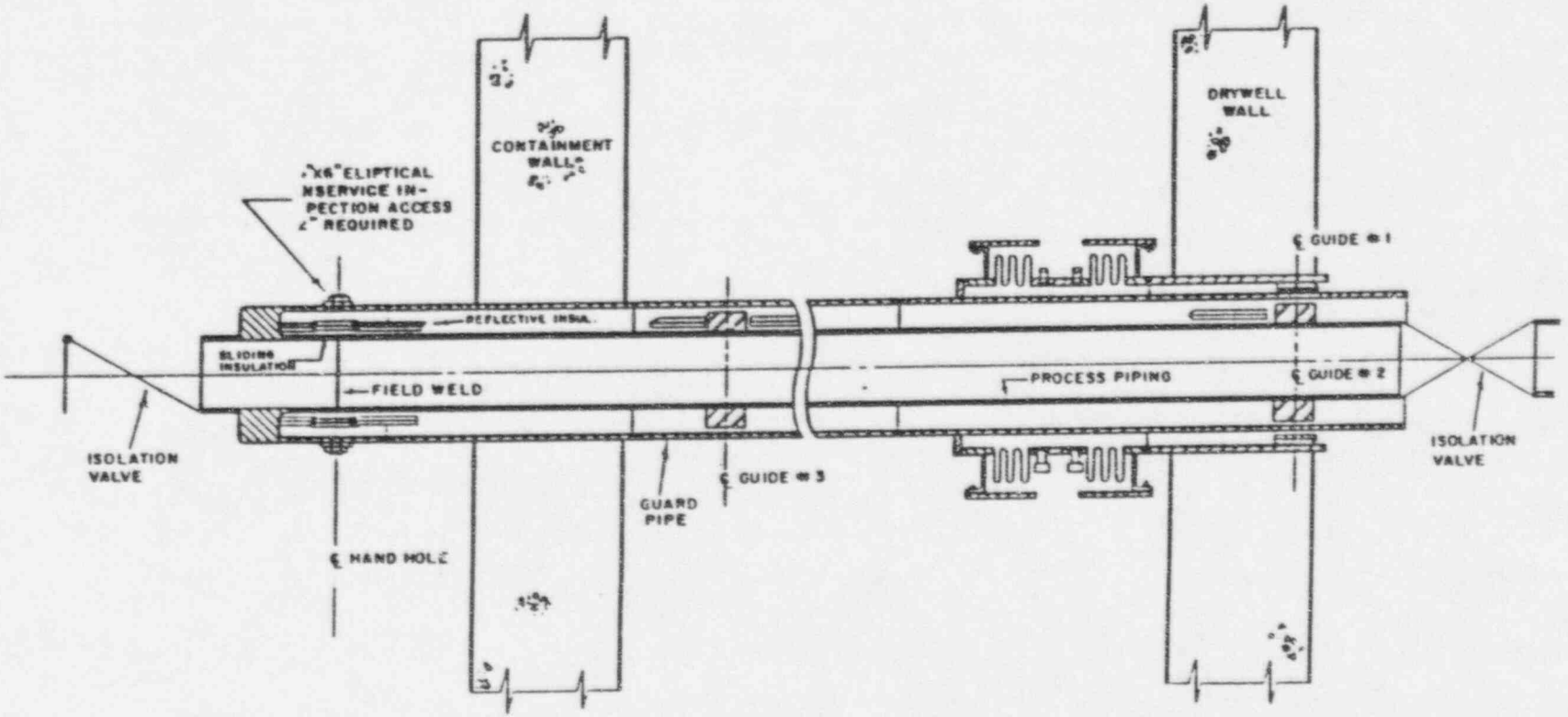
ITEM NO.	SYSTEM NO.	WELD NO.	ISO NO.	PIPE SIZE	COMPONENT	EXAMINABLE VOLUMETRIC AREA	TYPE SCAN	EXAMINABLE SURFACE AREA	CLASS	WELD TYPE	REASON FOR LIMITATIONS
1	B21	G12-C1-A	MS-11-9	28"	PIPE TO PIPE	27%	T	NOTE 1	1	CIRC	GUARD PIPE
2	B21	G12-A1-A	MS-11-3	28"	PIPE TO PIPE	27%	T	NOTE 1	1	CIRC	GUARD PIPE
3	B21	G12-D1-A	MS-11-12	28"	PIPE TO PIPE	27%	T	NOTE 1	1	CIRC	GUARD PIPE
4	B21	G12-B1-A	MS-11-6	28"	PIPE TO PIPE	27%	T	NOTE 1	1	CIRC	GUARD PIPE
5	B21	W2	FW-11-1	24"	PIPE TO PIPE	24%	T	NOTE 1	1	CIRC	GUARD PIPE
6	B21	W18	FW-11-7	24"	PIPE TO PIPE	24%	T	NOTE 1	1	CIRC	GUARD PIPE
7	DELETED										
8	E12	W47	RH-11-1	20"	PIPE TO PIPE	19%	T	NOTE 1	1	CIRC	GUARD PIPE
9	DELETED										
10	E51	W7	RI-11-3	10"	PIPE TO PIPE	100%	T	NOTE 1	1	CIRC	GUARD PIPE
11	G33	W18	CU-11-3	6"	PIPE TO PIPE	50%	T	NOTE 1	1	CIRC	GUARD PIPE

NOTE 1: The percentage of each weld that is accessible for surface examination will be recorded during the inservice examination.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-0007, REVISION 2

FIGURE 1



VERTICAL SECTION THRU GUARD PIPE ASSEMBLY

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00008, REVISION 3

INSERVICE INSPECTION
OF CONTROL ROD DRIVE AND INCORE HOUSING WELDS & FLANGE BOLTING

I. Component:

Peripheral control rod drive housing welds (tube-to-tube, tube-to-flange) and bolting located on CRD housings.

II. Code:

These portions of the CRD and in-core housing were designed and fabricated to the ASME Section III, Class 1 requirements. Applicable inservice inspections are to be performed in accordance with ASME Section XI, 1977 Edition through and including Summer 1979 Addenda.

III. Code requirements:

1. Welds located in 10% of the peripheral CRD housings require surface examination (dye penetrant) during each ten-year inservice inspection interval in accordance with ASME Section XI, Table IWB-2500-1, Examination Category B-O.

2. Pressure retaining bolting for the flange-to-flange joints, located on the CRD and incore housings, are required to be visually examined (VT-1) once every ten-year inspection interval in accordance with ASME Section XI, Table IWB-2500-1, Examination Category B-G-2.

IV. Information to support the determination that the code requirements are impractical:

The weld areas and bolting are not accessible for inspection unless the control rod drive (CRD) support structures are removed. A 360° surface examination cannot be accurately accomplished from the outside, due to interference from the adjacent CRD housings. Inspection of the weld from the inside of the CRD housing would require that the CRD mechanism be removed, which could result in damage to the drive. With removal of the drive, a small amount of reactor water would escape to the CRD cavity area, possibly causing contamination of personnel and equipment. The time frame associated with the CRD support structure removal and CRD mechanism would be approximately six (6) man hours per drive. Dosage received by personnel in this interval cannot justify the inspection process to possibly find a fault which could be discovered by excessive leakage in the drywell sump monitored per Operating License Manual (Technical Specification) limits in effect.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00008, REVISION 3

INSERVICE INSPECTION
OF CONTROL ROD DRIVE AND INCORE HOUSING WELDS & FLANGE BOLTING

V. Specific relief requested:

Permission is requested to exempt from inservice inspection, the peripheral CRD housing welds (tube-to-tube, tube-to-flange), the eight (8) bolts associated with each flange of 193 CRD housings and the four bolts associated with each flange of 58 incore housings.

VI. Reasons why relief should be granted:

Request for exemption from inservice inspection should be granted for the following reasons:

1. The peripheral CRD housing welds have been examined by radiography and liquid penetrant methods and have been hydrostatic tested in accordance with ASME Section III code requirements.

2. All incore and CRD housing bolting has been examined in accordance with the requirements of ASME Section III, which exceed the Section XI (VT-1) visual examination requirements.

3. The welds and bolted connections will be subject to pressure testing in accordance with the requirements of ASME Section XI, Table IWB-2500-1 and ASME Section XI Code Case N-498-1.

4. If the welds and/or the bolts fail while in operation, the maximum leakage rate, by calculation, will occur at at the peripheral CRD housing tube-to-flange weld. The maximum calculated leak rate is to 681 gpm. By criteria established in Subarticle IWB-1200, "exemptions by make up capacity," the normal make up capability for GGNS is 878 gpm, which exceeds the calculated maximum leakage.

5. Leak detection is provided with the leakage detection system, with continuous monitoring in the control room.

6. The CRD housing supports would prevent ejection of the housings in case of total failure of the welds or bolts.

7. Removal of the CRD support structure would result in hardships with no compensatory increase in the level of quality and safety.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00008, REVISION 3

INSERVICE INSPECTION
OF CONTROL ROD DRIVE AND INCORE HOUSING WELDS & FLANGE BOLTING

VII. Alternate testing:

None

NOTE: A similar request for relief from preservice inspection requirements was accepted by NRC in GGNS Safety Evaluation Report, Supplement #2.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00009, REVISION 3

INSERVICE INSPECTION OF PUMP CASING AND ATTACHMENT WELDS

I. Component:

Pump casing and attachment welds located within the surrounding concrete pump support encasement for the following pumps (see attached list and sketches):

PUMP	PUMP NO.	SKETCH NO.
Residual Heat Removal	1E12C002B	RH-8-12
Low Pressure Core Spray	1E21C001	LP-9-4
High Pressure Core Spray	1E22C001	HP-8-10

II. Code:

The three pumps listed above were designed and fabricated to the ASME Section III, class 2 requirements. Applicable Inservice Inspection is to be preformed in accordance with ASME Section XI, 1977 Edition through and including Summer 1979 Addenda and Code Case N 343.

III. Code Requirements:

Pressure retaining welds, and attachment welds that provide a support function are required to receive a surface examination once every ten-year interval in accordance with ASME Section XI, Table IWC-2500-1 category C-C and C-G.

IV. Information to support the determination that the Code requirements are impractical:

Inaccessible pump casing welds are located where the concrete pump support encasement only allows a 3 inch clearance between the pump casing and the concrete encasement wall (see figure 1 for details of the design). Due to the limited accessibility, it is impractical to surface examine those portions of the welds located within the surrounding concrete pump support encasement. The 1E12C002B and 1E21C001 pumps also have a support integrally welded to the bottom exterior of the pump barrel that rests against the sump floor. The clearance between the floor and the bottom of the barrel is approximately 1 inch preventing sufficient access to perform the surface examination of the 1/2 inch of base material on each side of the attaching weld (see figure 2).

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00009, REVISION 3

INSERVICE INSPECTION OF PUMP CASING AND ATTACHMENT WELDS

V. Specific relief Requested:

Permission is requested to exempt from inservice inspection the inaccessible portions of the pump casing welds listed on Table 1. Also permission is requested to exempt the base material associated with the support attachment welds from the surface examinations as shown in figure 2.

VI. Reasons why relief should be granted:

Request for exemption should be granted for the following reasons:

1. The pump casing welds have been volumetrically examined by radiography and passed in accordance with the ASME Section III, Class 2 requirements.

2. The attachment welds were surface examined and accepted in accordance with the requirements of ASME Section III, Class 2 requirements.

3. The accessible length of each applicable casing weld will be surface examined in accordance with ASME Class 2 requirements.

4. The entire weld volume of each support attachment weld will be surface examined in accordance with ASME Class 2 requirements.

5. The failure of these welds, thus leading to failure of the pump, would have no adverse effect on plant safety, as redundant emergency core cooling systems are provided.

6. Annunciators (i.e. low suction pressure, discharge pressure abnormal, etc.) are provided in the control room, along with other system indicators, to alert the operators to abnormal operating conditions.

7. The systems, including the pumps, are tested per the GGNS Operating License Manual (Technical Specifications) requirements to ensure operability.

8. Pumps will be subject to pressure testing in accordance with ASME Section XI, Table IWC-2500-1 and ASME Section XI Code Case N-498-1.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00010, REVISION 6

INSERVICE EXAMINATION
OF PRESSURE RETAINING WELDS

VI. Reasons why relief should be granted:

Request for permission to limit the code required examination to the accessible areas should be granted for the following reasons:

1. The inaccessible portions of listed pressure retaining welds were examined by radiography, passed in accordance with ASME Section III, Class 1 and 2 requirements.

2. The inaccessible portions of the pressure retaining and integral attachment welds were surface examined (magnetic particle or liquid penetrant), passed in accordance with ASME III and/or XI, Class 1 and Class 2 requirements.

3. The piping welds with limited examinations will be subject to pressure testing in accordance with ASME Section XI, Table IWB-2500-1 or IWC-2500-1, as applicable, and ASME Section XI Code Case N-498-1.

4. Deleted

5. Accessible portions of listed welds will be volumetrically and surface examined each inspection interval in accordance with ASME Section XI. Should indications be found, an engineering evaluation will be made to determine if the inaccessible portions of the listed welds have been affected.

6. Leak detection is provided, by way of the leakage detection system with continuous monitoring, for the RHR, RCIC, MS, RWCU, RECIRC and FW systems.

7. The failure of any one of these pressure retaining piping welds would have no adverse effect on plant safety as there is isolation capability and/or shut down capability as part of the plant design. The design analysis bounds the limiting fault conditions for line breads in and outside of containment.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00010, REVISION 6

INSERVICE EXAMINATION
OF PRESSURE RETAINING WELDS

8. The calculated maximum piping stresses and usage factor at the integral attachments on the piping, including consideration of the local pipe wall stresses, have been determined in the Class 1 Stress Report and are equal to the following:

   Item No. 45, 46, 47, and 48 (System No. B21)

   a) Primary plus secondary (equation 10); 32,775 psi (1.72 S_m),

   b) Usage factor is 0.0442.

   Item No. 78 and 79 (System No. B33)

   a) Primary plus secondary (equation 10); 22,792 psi (1.37 S_m),

   b) Usage Factor is 0.0071

   Circumferential and longitudinal welds in piping with stress levels below 2.4 S_m and usage factors below 0.4 are excluded from ISI examinations, in accordance with Table IWB-2500-1 Category B-J.

9. Examinations at GGNS of category B-J, B-K-1 and C-F welds have not identified any flaws or evidence of service induced degradation.

VII. Alternate testing:

The applicable welds will be examined to the maximum extent practical as determined by the extent of the specific limitation. Each weld will be subjected to a volumetric or surface examination as required by Talbes IWB and IWC 2500-1.

4

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00009, REVISION 3

TABLE 1

LIST OF PUMP WELDS

E12 - RHR PUMP "B" CASING

Welds Surfaces That Shall Be Examined

DH-1	DH-4	DH-7	SB-4	SB-7
DH-2	DH-5	DH-25	SB-5	
DH-3	DH-6	SB-3	SB-6	

Welds That Can Be Partially Examined
SB-2 (18" accessible, 54" inaccessible)

Welds that cannot be examined
SB-1 (inaccessible)

Attachment welds that can be partially examined
SB-12 (see figure 2 for details of limitation)

E21 - LPCS PUMP CASING

Welds Surfaces That Shall Be Examined

DH-1	DH-4	DH-7	SB-4	SB-7
DH-2	DH-5	DH-27	SB-5	
DH-3	DH-6	SB-3	SB-6	

Welds That Can Be Partially Examined
SB-2 (3" accessible, 69" inaccessible)

Welds That Cannot Be Examined
SB-1 (inaccessible)

Attachment Welds That Can Be Partially Examined
SB-12 (see figure 2 for details of limitation)

E22 - HPCS PUMP CASING

Welds Surfaces That Shall Be Examined

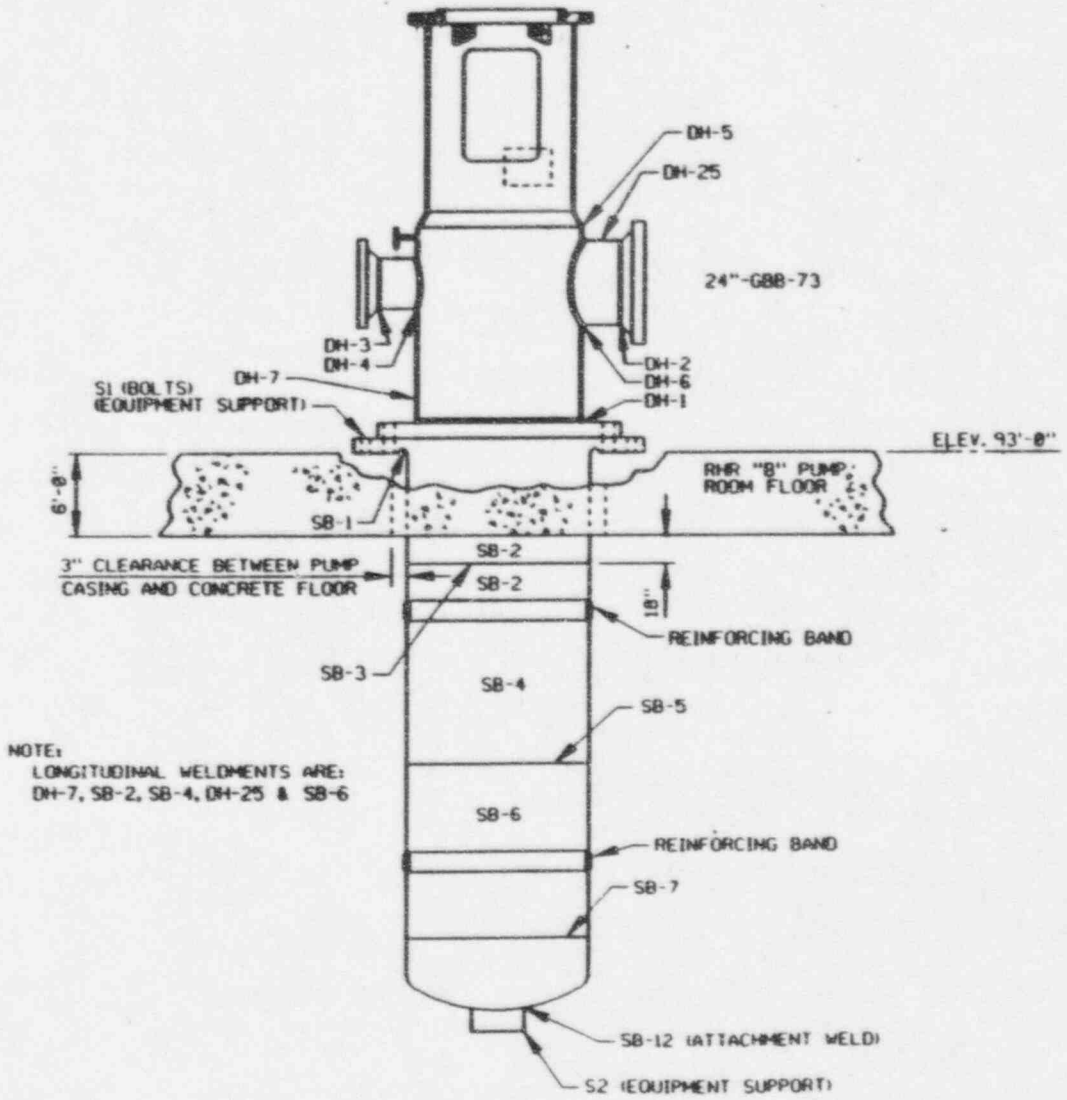
DH-1	DH-4	DH-7	SB-4	SB-7
DH-2	DH-5	DH-19	SB-5	
DH-3	DH-6	DH-28	SB-6	

Welds That Can Be Partially Examined
Deleted

Welds That Cannot Be Examined
SB-1 (inaccessible)
SB-2 (inaccessible)
SB-3 (inaccessible)

RELIEF REQUEST I-00009, REVISION 3

FIGURE 1

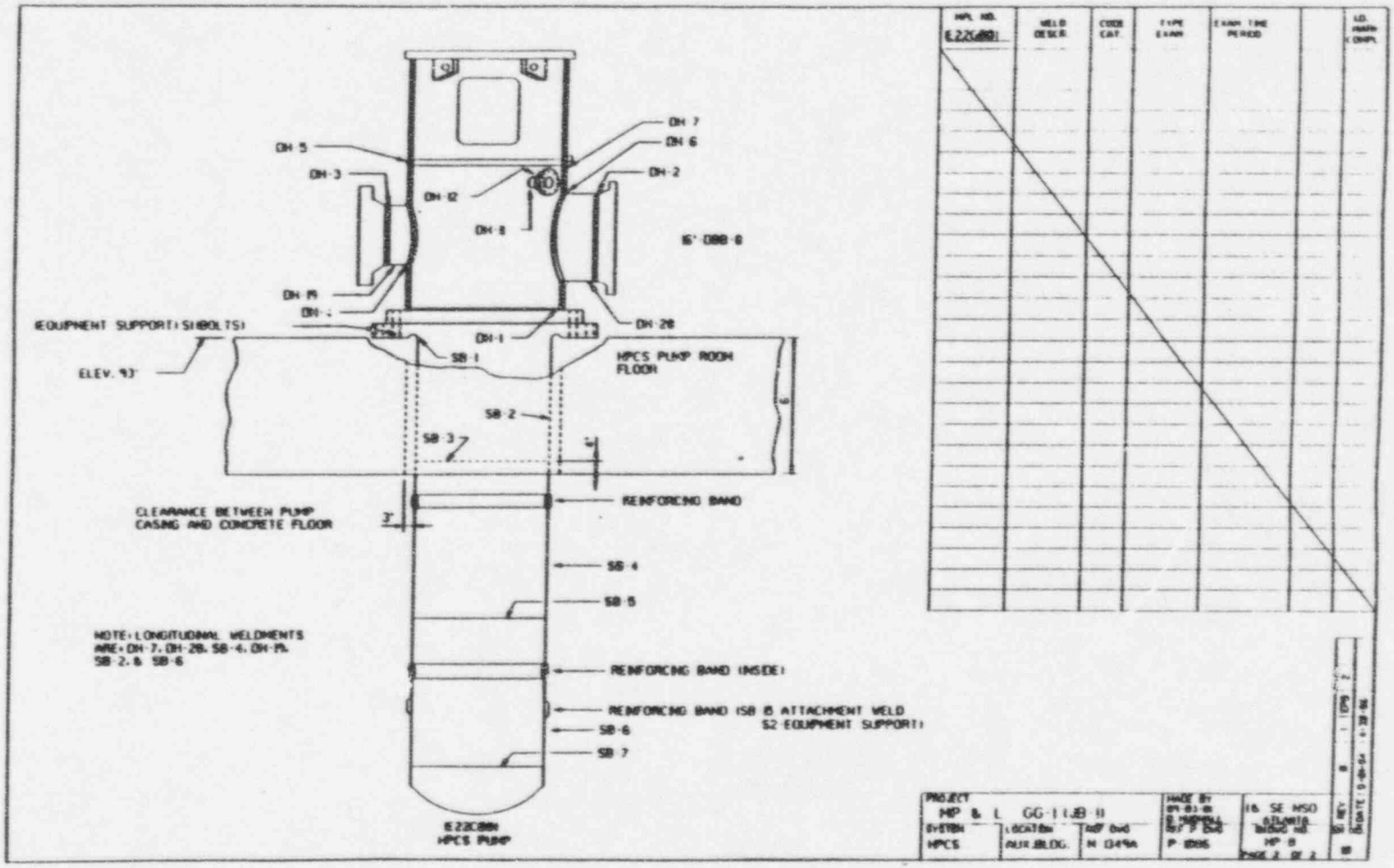


MPL No. IE12G010

SYSTEM	LOCATION	REF DWG	REF P DWG	PSI DWG NO.	REV.
RHR B	AUX. BLDG.	M-1348B	P-1085A	RH-B-12 PAGE 2 OF 2	U

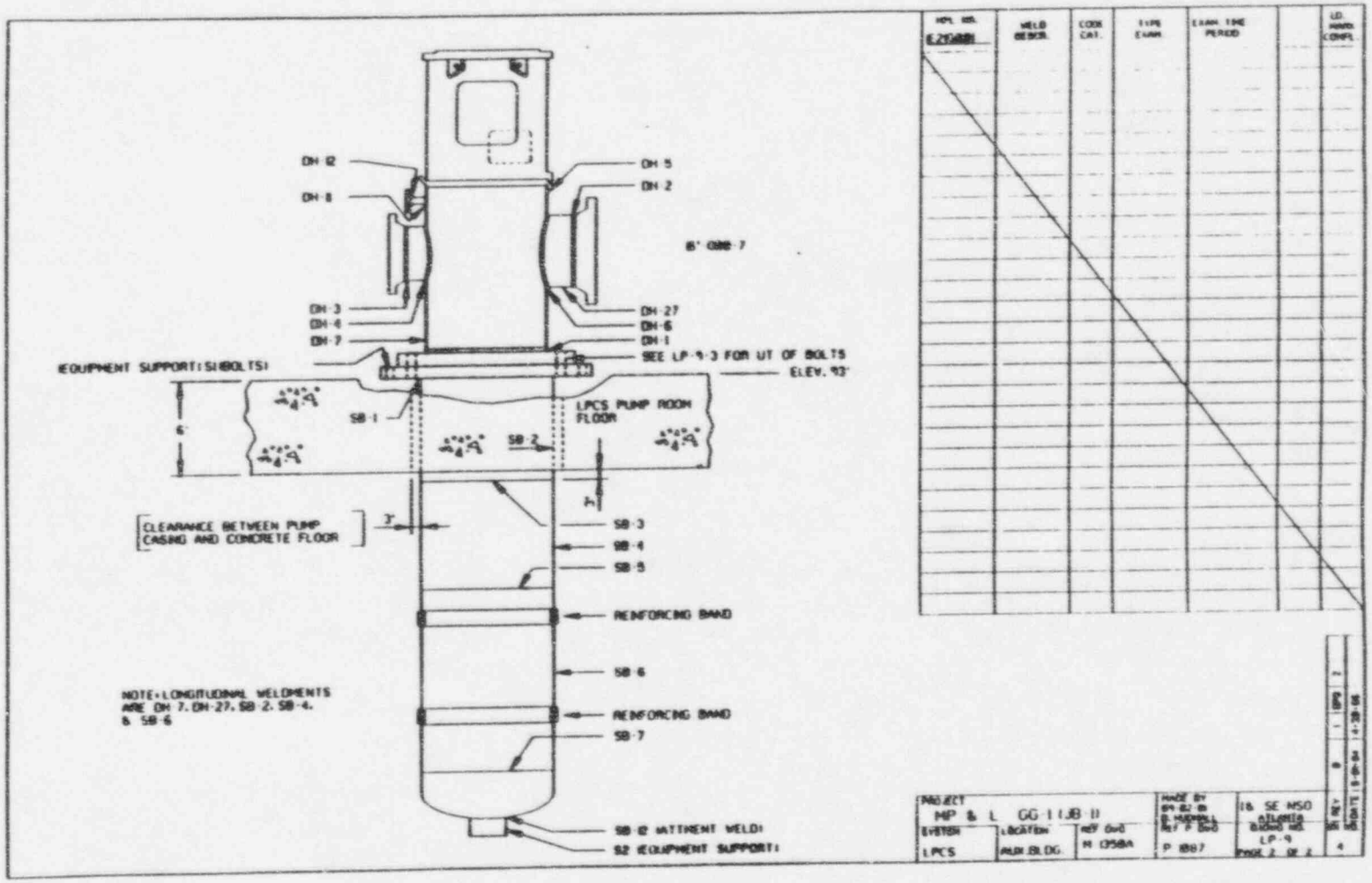
RELIEF REQUEST I-00009, REVISION 3

FIGURE 1



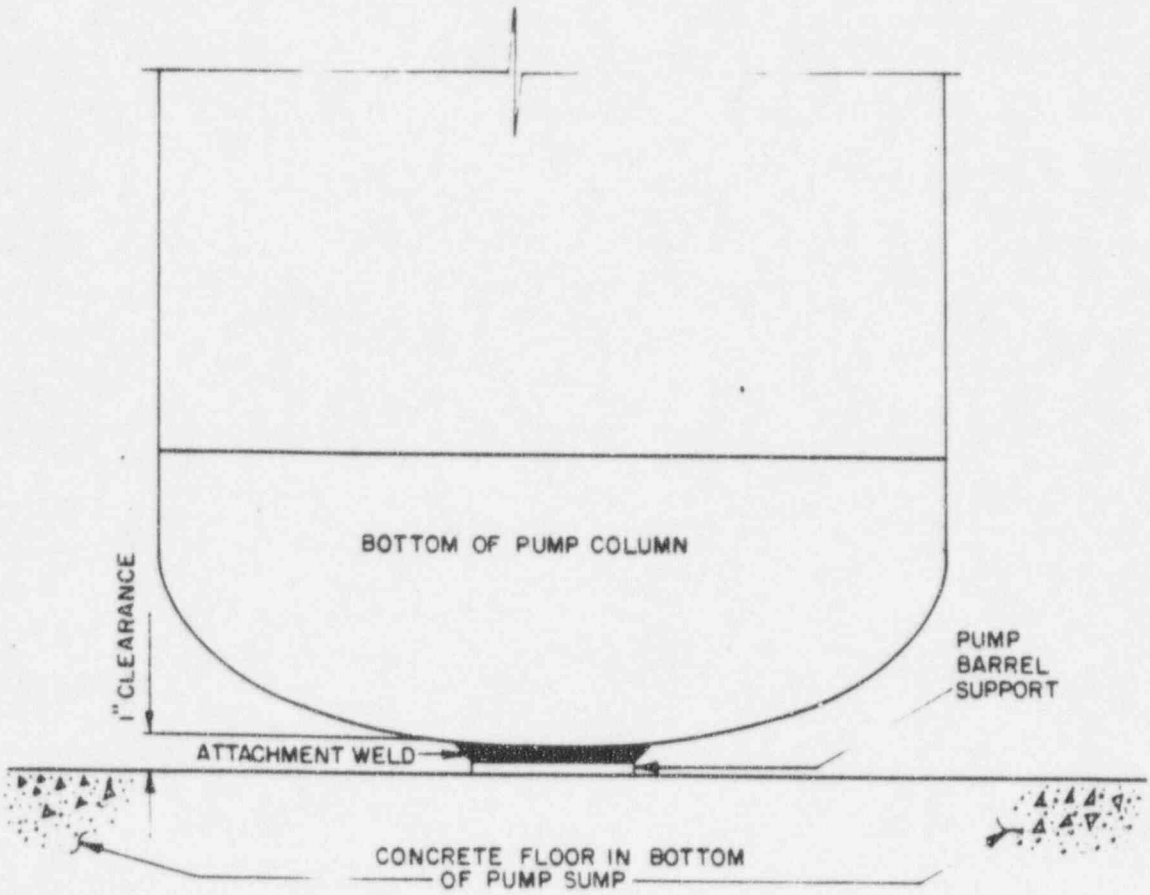
RELIEF REQUEST I-00009, REVISION 3

FIGURE 1



RELIEF REQUEST I-00009, REVISION 3

FIGURE 2



ATTACHMENT WELD LIMITATIONS
PUMPS 1E12C002B AND 1E21C001

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00010, REVISION 6

INSERVICE EXAMINATION
OF PRESSURE RETAINING WELDS

I. Component:

Inaccessible portions of ASME Section III, Class 1 and 2 pressure retaining and integral attachment piping welds listed in Table 1 (see attached).

II. Code:

These portions of the pressure retaining and integral attachment piping welds were designed and fabricated to ASME Section III, Class 1 and Class 2 requirements. Applicable inservice inspections are to be performed in accordance with the ASME Section XI, 1977 Edition, through and including the Summer 1979 Addenda.

III. Code Requirements:

Class 1 and Class 2 pressure retaining piping welds are required to be volumetrically and surface examined, essentially 100% of the weld, once every ten year interval in accordance with ASME Section XI, Table IWB-2500-1, Category B-J, Table IWC-2500-1, Category C-F. The Class 1 integral attachment welds depicted in table 1 are required to be surface examined once each ten year interval in accordance with ASME Section XI, Table IWB-2500-1, Category B-K-1.

IV. Information to support the determination that the Code requirements are impractical:

Portions of welds that were preservice examined have physical obstructions due to design. Due to this limited accessibility, it is impractical to perform the surface and volumetric examination for 100% of the required examination volume as indicated for the welds listed in Table 1.

V. Specific Relief Requested:

Permission is requested to perform the Code required examinations to the extent described in Table 1.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00009, REVISION 3

INSERVICE INSPECTION OF PUMP CASING AND ATTACHMENT WELDS

9. Approximately 82 percent of the welds on the subject pump, which require surface examination, are accessible. Performance of the required examinations on these accessible welds should ensure that generic degradation is not occurring in these pump casing welds.

NOTE: A similar request for relief from preservice inspection of the pump casing welds has been accepted by the NRC in GGNS Safety Evaluation Report, Supplement No. 2.

VII. Alternate Testing:

None

GRAND GULF NUCLEAR STATION
UNIT 1
RELIEF REQUEST I-00010, REVISION 6

TABLE 1

ITEM NO	SYSTEM NO	WELD NO	ISO NO	PIPE SIZE	COMPONENT	EXAMINABLE VOLUMETRIC AREA	TYPE SCAN	EXAMINABLE SURFACE AREA	CLASS	WELD TYPE	REASON FOR LIMITATIONS
1	E12	G014-FW-44	RH-8-8	6"	VALVE TO ELBOW	55%	T	100%	1	CIRC	ELBOW RADIUS
2	B21	G9-C1-B-L/B	MS-11-8	28"	ELBOW SEAM	38%	T	38%	1	LONG	PIPE RESTRAINT
3	E51	G004-8-8-1	RI-8-2	6"	ELBOW TO ELBOW	70%	T	100%	2	CIRC	ELBOW RADIUS
4	B21	G11-D1-B-L/B	MS-11-11	28"	ELBOW SEAM	38%	T	38%	1	LONG	PIPE RESTRAINT
5	B21	G8-A1-B-L/B	MS-11-2	28"	ELBOW SEAM	38%	T	38%	1	LONG	PIPE RESTRAINT
6	B21	G030-FW-23	FW-8-2	24"	VALVE TO PIPE	93%	T	100%	1	CIRC	SOCK-O-LET
7	B21	G030-FW-36	FW-8-4	24"	VALVE TO PIPE	93%	T	100%	1	CIRC	SOCK-O-LET
8	B21	G026-FW-17	FW-11-7	24"	PIPE TO TEE	93%	T	100%	1	CIRC	SOCK-O-LET
9	B21	G001-W4	MS-11-3	28"	VALVE TO PIPE	82%	T	100%	1	CIRC	PIPE RESTRAINT
10	B21	G001-W4	MS-11-9	28"	VALVE TO ELBOW	82%	T	100%	1	CIRC	PIPE RESTRAINT
11	B21	G9-C1-B-L/A	MS-11-8	28"	ELBOW SEAM	38%	T	38%	1	LONG	PIPE RESTRAINT
DELETED											
13	E51	G004-7-8-4	RI-8-1	10"	REDUCER TO TEE	71%	T	100%	2	CIRC	TEE
14	E51	G004-7-8-9	RI-8-1	10"	REDUCER TO TEE	71%	T	100%	2	CIRC	TEE
15	E51	G004-7-8-8	RI-8-1	10"	REDUCER TO TEE	71%	T	100%	2	CIRC	TEE
16	B33	G024-W2	RR-11-19	4"	ELBOW TO TEE	62%	T	100%	1	CIRC	TEE
DELETED											
18	B21	G11-D1-B-L/A	MS-11-11	28"	ELBOW SEAM	38%	T	38%	1	LONG	PIPE RESTRAINT
19	B21	G001-W9	MS-11-12	28"	VALVE TO PIPE	82%	T	100%	1	CIRC	PIPE RESTRAINT
20	B21	G8-A1-B-L/A	MS-11-2	28"	ELBOW SEAM	38%	T	38%	1	LONG	PIPE RESTRAINT
21	E51	G001-W1	RI-8-12	6"	VALVE TO ELBOW	73%	T	100%	2	CIRC	ELBOW RADIUS
22	E51	G001-W40	RI-11-4	6"	VALVE TO ELBOW	51.5%	T	100%	1	CIRC	ELBOW RADIUS
23	B33	G001-W5	RR-11-2	24"	ELBOW TO PUMP	73% see note 1	T	100%	1	CIRC	PUMP
24	B33	G001-W6	RR-11-2	24"	PIPE TO PUMP	58% see note 1	T	100%	1	CIRC	PUMP
25	B33	G001-W8	RR-11-3	24"	VALVE TO PIPE	50% see note 2	T	100%	1	CIRC	VALVE
26	B33	G001-W28	RR-11-9	24"	ELBOW TO PUMP	62% see note 1	T	100%	1	CIRC	PUMP
27	B33	G001-W29	RR-11-9	24"	PUMP TO PIPE	61% see note 1	T	100%	1	CIRC	PUMP

GRAND GULF NUCLEAR STATION
UNIT 1
RELIEF REQUEST I-00010, REVISION 6

TABLE 1

ITEM NO	SYSTEM NO	WELD NO	ISO NO	PIPE SIZE	COMPONENT	EXAMINABLE VOLUMETRIC AREA	TYPE SCAN	EXAMINABLE SURFACE AREA	CLASS	WELD TYPE	REASON FOR LIMITATIONS
28	B33	G001-W31	RR-11-10	24"	VALVE TO PIPE	50% see note 1&2	T	100%	1	CIRC	VALVE
29	B33	G5-B1-B	RR-11-9	4"/24"	SWEEP TO PIPE	59% see note 1	T	100%	1	BRANCH	SWEEP-O-LET
30	B33	G5-B1-E	RR-11-9	4"/24"	SWEEP TO PIPE	63% see note 1	T	100%	1	BRANCH	SWEEP-O-LET
31	B33	G023-W37	RR-11-15	20"	TEE TO PIPE	65% see note 1	T	100%	1	CIRC	TEE
32	B33	G024-W8	RR-11-16	4"	PIPE TO SWEEP	50% see note 2	T	100%	1	CIRC	SWEEP-O-LET
33	B33	G024-W27	RR-11-17	4"	PIPE TO SWEEP	50% see note 2	T	100%	1	CIRC	SWEEP-O-LET
34	B33	G10-B1-L	RR-11-11	12"/16"	SWEEP TO PIPE	50% see note 3	P	100%	1	BRANCH	SWEEP-O-LET
35	B33	G10-B1-K	RR-11-11	12"/16"	SWEEP TO PIPE	50% see note 3	P	100%	1	BRANCH	SWEEP-O-LET
36	B33	G10-B1-J	RR-11-11	12"/16"	SWEEP TO PIPE	50% see note 3	P	100%	1	BRANCH	SWEEP-O-LET
37	B33	G10-B1-H	RR-11-11	12"/16"	SWEEP TO PIPE	50% see note 3	P	100%	1	BRANCH	SWEEP-O-LET
38	B33	G10-B1-G	RR-11-11	12"/16"	SWEEP TO PIPE	50% see note 3	P	100%	1	BRANCH	SWEEP-O-LET
39	B33	G10-B1-F	RR-11-11	12"/16"	SWEEP TO PIPE	50% see note 3	P	100%	1	BRANCH	SWEEP-O-LET
40	B33	G001-W34	RR-11-11	24"	PIPE TO CROSS	50% see note 3	P	100%	1	CIRC	CROSS
41	B33	G10-B1-A	RR-11-11	16"	PIPE TO CROSS	50% see note 3	P	100%	1	CIRC	CROSS
42	B33	G10-B1-B	RR-11-11	16"	PIPE TO CROSS	50% see note 3	P	100%	1	CIRC	CROSS
43	B21	G8-A1-C	MS-11-2	8"/28"	SWEEP TO PIPE	100%	T	98%	1	BRANCH	PIPE SUPPORT
44	B21	G026-W36	FW-11-1	24"	PIPE TO VALVE	95%	T	100%	1	CIRC	PIPE SUPPORT
45	B21	G8-A1-L,M,N,P	MS-11-2	28"	LUGS TO PIPE	N/A	N/A	49%	1	INT ATT	PIPE RESTRAINT
46	B21	G10-B1-L,M,N,P	MS-11-5	28"	LUGS TO PIPE	N/A	N/A	49%	1	INT ATT	PIPE RESTRAINT
47	B21	G9-C1-L,M,N,P	MS-11-8	28"	LUGS TO PIPE	N/A	N/A	49%	1	INT ATT	PIPE RESTRAINT
48	B21	G11-D1-L,M,,N,P	MS-11-11	28"	LUGS TO PIPE	N/A	N/A	49%	1	INT ATT	PIPE RESTRAINT
49	B33	G001W27	RR-11-9	24"	PIPE TO VALVE	50% see note 1	T	100%	1	CIRC	VALVE
50	B33	G001W33	RR-11-10	24"	VALVE TO PIPE	50% see note 1	T	100%	1	CIRC	VALVE
51	B33	G10-A1-A	RR-11-4	16"	CROSS TO PIPE	50% see note 3	P	100%	1	CIRC	CROSS
52	B33	G10-A1-B	RR-11-4	16"	CROSS TO PIPE	50% see note 3	P	100%	1	CIRC	CROSS
53	B33	G6-B1-C	RR-11-9	4"/24"	PIPE TO SWEEP	50% see note 1	T	100%	1	BRANCH	SWEEP
54	B33	G10-A1-F	RR-11-4	16"/12"	PIPE TO SWEEP	50% see note 3	P	100%	1	BRANCH	SWEEP

GRAND GULF NUCLEAR STATION
UNIT 1
RELIEF REQUEST I-00010, REVISION 6

TABLE 1

ITEM NO	SYSTEM NO	WELD NO	ISO NO	PIPE SIZE	COMPONENT	EXAMINABLE VOLUMETRIC AREA	TYPE SCAN	EXAMINABLE SURFACE AREA	CLASS	WELD TYPE	REASON FOR LIMITATIONS
55	B33	G10-A1-G	RR-11-4	16"/12"	PIPE TO SWEEP	50% see note 3	P	100%	1	BRANCH	SWEEP
56	B33	G10-A1-H	RR-11-4	16"/12"	PIPE TO SWEEP	50% see note 3	P	100%	1	BRANCH	SWEEP
57	B33	G10-A1-J	RR-11-4	16"/12"	PIPE TO SWEEP	50% see note 3	P	100%	1	BRANCH	SWEEP
58	B33	G10-A1-K	RR-11-4	16"/12"	PIPE TO SWEEP	50% see note 3	P	100%	1	BRANCH	SWEEP
59	B33	G10-A1-L	RR-11-4	16"/12"	PIPE TO SWEEP	50% see note 3	P	100%	1	BRANCH	SWEEP
60	B33	G001W4	RR-11-2	24"	VALVE TO PIPE	50% see note 1	T	100%	1	CIRC	VALVE
61	B33	G001W9	RR-11-3	24"	PIPE TO VALVE	50% see note 1	T	100%	1	CIRC	VALVE
62	B33	G001W10	RR-11-3	24"	VALVE TO PIPE	50% see note 1	T	100%	1	CIRC	VALVE
63	B33	G6-A1-C	RR-11-2	4"/24"	PIPE TO SWEEP	50% see note 1	T	100%	1	BRANCH	SWEEP
64	B33	G5-A1-E	RR-11-2	4"/24"	PIPE TO SWEEP	50% see note 1	T	100%	1	BRANCH	SWEEP
65	B33	G5-A1-B	RR-11-2	4"/24"	PIPE TO SWEEP	50% see note 1	T	100%	1	BRANCH	SWEEP
66	B21	G11-D1-C	MS-11-11	28"/10"	PIPE TO SWEEP	57%	T	97%	1	BRANCH	HANGER
67	B21	G10-B1-C	MS-11-5	28"/10"	PIPE TO SWEEP	71%	T	100%	1	BRANCH	HANGER
68	B21	G10-B1-E	MS-11-5	28"/10"	PIPE TO SWEEP	71%	T	85%	1	BRANCH	HANGER
69	B21	G10-B1-F	MS-11-5	28"/10"	PIPE TO SWEEP	78%	T	100%	1	BRANCH	HANGER
70	B21	G10-B1-H	MS-11-5	28"/10"	PIPE TO SWEEP	78%	T	100%	1	BRANCH	HANGER
71	B21	G10-B1-G	MS-11-5	28"/10"	PIPE TO SWEEP	78%	T	100%	1	BRANCH	HANGER
72	E51	G004W18	RI-8-21	6"	VALVE TO PIPE	83.18%	T	100%	2	CIRC	PIPE RESTRAINT
73	G33	G012W54	CU-11-13	6"	VALVE TO ELBOW	85.59%	T	100%	1	CIRC	ELBOW RADIUS
74	B21	G001W5	MS-11-9	28"	VALVE TO PIPE	62.8%	T	100%	1	CIRC	VALVE
75	B21	G001W10	MS-11-12	28"	VALVE TO PIPE	80.8%	T	100%	1	CIRC	VALVE
76	B33	G001W3	RR-11-1	24"	ELBOW TO VALVE	30.0%	T	100%	1	CIRC	VALVE
77	B33	G001W26	RR-11-8	24"	ELBOW TO VALVE	50.0%	T	100%	1	CIRC	VALVE
78	B33	G3-A1-F,G,H,I	RR-11-1	24"	LUGS TO PIPE	N/A	N/A	75%	1	INT ATT	PIPE RESTRAINT
79	B33	G4-B1-H,J,K,L	RR-11-8	24"	LUGS TO PIPE	N/A	N/A	75%	1	INT ATT	PIPE RESTRAINT
80	E32	G119W32	IV-8-3	1.5'	TEE TO ELBOW	N/A	N/A	83%	1	CIRC	PIPE SUPPORT
81	E51	G001W39	RI-11-4	6"	PIPE TO VALVE	79.0%	T	100%	1	CIRC	VALVE

GRAND GULF NUCLEAR STATION
UNIT 1
RELIEF REQUEST I-00010, REVISION 6

TABLE 1

LEGEND:

P = SCAN PARALLEL TO THE WELD

T = SCAN TANGENT (PERPENDICULAR) TO THE WELD

NOTES:

1. In addition to the "T" scan limitation, these welds are augmented by the requirements of NUREG 0313 and therefore are examined with a parallel scan that is not required by ASME Section XI. The parallel scan is limited to one side of the weld (50%) due to the fittings being joined by the weld.

2. 100% coverage was obtained in one direction only, using refracted longitudinal wave.

3. The "P" scan is performed for compliance with NUREG 0313, 100% of ASME Section XI coverage is obtained without limitation.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00011, REVISION 2

INSERVICE INSPECTION
OF THERMAL TEE SLEEVE WELDS

DELETED

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00012, REVISION 2

INSERVICE INSPECTION
OF PRESSURE RETAINING WELDS

I. Component:

Inaccessible portion of Class 1 pressure retaining piping weld located on reactor core isolation cooling (RCIC, E51). (See Table 1 for details.)

II. Code:

This portion of the pressure retaining piping weld was designed and fabricated to the ASME Section III, Class 1 requirements. Applicable inservice inspections are to be performed in accordance with the ASME Section XI, 1977 Edition through and including Summer 1979 Addenda.

III. Code requirements:

Class 1 pressure retaining piping welds that are required to be volumetrically and surface examined essentially 100% of the weld, once every ten-year interval in accordance with ASME Section XI, Table IWB-2500-1, Category B-J.

IV. Information to support the determination that the code requirements are impractical:

A portion of listed weld that was preservice examined has a physical obstruction due to design. Due to the limited accessibility, it is impractical to volumetrically examine 100% of the weld listed in Table 1.

V. Specific relief requested:

Permission is requested to exempt from volumetric examination the inaccessible portions of the Class 1 weld listed in Table 1.

VI. Reasons why relief should be granted:

Request for and exemption should be granted for the following reasons:

1. The entire listed weld was examined by radiography and passed in accordance with ASME Section III, Class 1 requirements.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00012, REVISION 2

INSERVICE INSPECTION
OF PRESSURE RETAINING WELDS

2. The entire listed weld was surface examined (liquid penetrant) and passed in accordance with ASME Section III and/or XI, Class 1 requirements.

3. The listed weld was subject to a hydrostatic test and VT-2 examination in accordance with ASME Section XI, Class requirements and no leaks were found.

4. The listed piping weld will be subject to a system leakage test after each refueling outage for Class 1 in accordance with ASME Section XI requirements.

5. The listed weld will be subject to pressure testing in accordance with ASME Section XI, Table IWB-2500-1 and ASME Section XI Code Case N-498-1.

6. The entire listed weld, including that portion inaccessible for volumetric examination, will be surface examined each inspection interval, in accordance with ASME Section XI.

7. Accessible portion of listed weld will be volumetrically examined each inspection interval in accordance with ASME Section XI. Should indications be found, an engineering evaluation will be made to determine if the inaccessible portion of listed welds has been affected.

8. Leak detection is provided, by way of leakage detection system with continuous monitoring for the RCIC system.

9. The failure of this weld would have no adverse effect on plant safety as there is isolation capability as part of the plant design.

VII. Alternative testing:

The accessible portion of the weld identified in Table 1 will be inspected twice by volumetric examination during the ten-year interval.

3

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00012, REVISION 2

TABLE 1

ITEM NO.	SYSTEM NO.	WELD NO.	ISO NO.	PIPE SIZE	COMPONENT	LIMITED AREA	TYPE SCAN	CLASS	REASON FOR LIMITATIONS
1	E51	502	R1-11-7	6"	VALVE TO ELBOW	25%	T	1	RADIUS OF ELBOW

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00015, REVISION 2

INSERVICE INSPECTION
OF REACTOR PRESSURE VESSEL WELDS

I. Component:

Reactor pressure vessel (RPV) components, welds and associated base material identified in Table 1 of this relief request.

II. Code:

The Unit 1 RPV was designed and fabricated to ASME Section III, Class 1 requirements. Applicable inservice inspections are to be performed in accordance with Regulatory Guide 1.150, Revision 1, and ASME Section XI, 1977 Edition with Addenda through and including Summer 1979. Also, Relief Request No. I-00013 permits the use of ASME Section XI, 1983 Edition with the Summer 1983 Addenda, Figure IWB-2500-7(b) for identifying the Code-required examination volume.

III. Code requirements:

Table IWB-2500-1, Examination Category B-D, B-A, and B-F, requires specified volumes to be examined volumetrically at specified periods during the ten-year interval. Included in this volume is varying degrees of base material adjacent to each weld that also requires examination.

IV. Information to support the determination that the code requirements are impractical:

Due to geometric configurations of the GGNS Unit 1 reactor, certain code-required examination volumes, as depicted in ASME Section XI, cannot be examined to the extent of obtaining full code coverage. Table 1 provides a listing of the affected components and RPV welds with a detailed description of the cause and degree of the limitation.

Relief Request No. I-00014 provides engineering rationai addressing the limitations associated with the nozzle to vessel welds. The discussions provided prior operating plant experience to justify that no further examinations were necessary and additionally this was justified by recognizing that the feedwater nozzles are the limiting case. Although 100% of the code volumes were not examined for the nozzle to vessel welds, sufficient examination coverage was obtained to detect any potential cracking.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00015, REVISION 2

INSERVICE INSPECTION
OF REACTOR PRESSURE VESSEL WELDS

A study of the welds listed in Table 1 has shown that these weld locations are also bounded by the feedwater nozzle discussions. The stresses due to any expected loadings and conditions at these locations are bounded by those at the feedwater nozzle locations. Supporting the concept of the bounding is the fact that no indications have been found at any of the partially examined locations. In addition, it should be noted that a partial examination of each weld was obtained which included either all or a portion of the RPV inner surface.

V. Specific relief requested:

Permission is requested to perform ultrasonic examination within the limitations described in Table 1 of this relief request.

VI. Reasons why relief should be granted:

Relief as described within should be granted for the following reasons:

1. The entire RPV was subjected to an ASME Section III hydrostatic test after fabrication.

2. The entire RPV will be subjected to pressure testing in accordance with ASME Section XI, Table IWB-2500-1 and ASME Section XI Code Case N-498-1.

3. The subject welds were volumetrically examined in accordance with ASME Section III during fabrication.

4. There is no history of service-induced flaws in these areas of the RPV other than those of the feedwater nozzles discussed in Relied Request No. I-00014.

5. The areas of the RPV being examined are the limiting areas.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00024, REVISION 0

INSERVICE INSPECTION
OF CLASS 1 PUMP AND VALVE INTERNAL SURFACES

VI. Reasons why relief should be granted:

Alternate examination requirements for Class 1 pumps and valves should be granted for the following reasons:

1. All components are designed, fabricated, installed, and tested in accordance with the requirements of ASME Section III, Class 1.

2. The alternate examination requirements eliminate unnecessary man-Rem exposure and man-hours expenditure that provide no compensating increase in quality or safety.

3. The alternate examination requirements eliminate unnecessary component disassembly that would contribute to degrading component life and increase risks associated with potential reassembly errors.

4. The alternate requirements are in accordance with an edition of ASME Section XI endorsed in 10CFR50.

VII. Alternative testing:

None

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00015, REVISION 2

INSERVICE INSPECTION
OF REACTOR PRESSURE VESSEL WELDS

6. The potential for initiation and propagation of cracking has been discussed assuming both fatigue and stress corrosion cracking mechanisms. It was concluded by the use of limiting analyses results performed for the feedwater nozzle blend radii, that cracking is unlikely at Grand Gulf nozzle/vessel weld locations. In fact, even if it was hypothesized that these postulated cracks went undetected, a crack length of 58 inches was required before rapid crack growth was to occur during normal operation. It is unlikely that cracks of this size would go undetected. Therefore, a significant leak before break margin exists.

VII. Alternative testing:

None

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00015, REVISION 2

TABLE 1

WELD I.D.	CODE CATEGORY	ITEM NO.	DESCRIPTION OF EXAMINATION LIMITATION
Nozzle N7	B-D	B3.100	The N7 nozzle contains 12 1 3/8" diameter holes drilled and tapped 3 ¼" deep into the nozzle face. These holes prevent primary ultrasonic waves from reaching the bore region of the nozzle inner radius (see Figure 1).
Nozzle N8	B-D	B3.100	Same as the N7 nozzle.
Seams; DA, DB, DC, DD	B-A	B1.22	The RPV bottom head is constructed of four side plates and one center plate which are joined by four welds. Following preservice examinations, a total of 255 holes were bored into the bottom head assembly into which the following components were installed: 193 control rod drives, 58 incore tubes, 2 N15 drain lines, 1 N11 and 1 N18 core differential pressure lines. In addition to these, the RPV skirt is welded approximately 6" below the seam that attaches the shell to the head and an insulation bracket is mounted approximately 4" to 6" below the support skirt to bottom head weld that further restricts access to the four welds. The following portions of each weld are accessible for examination: DA - 44.4%, DB - 44.4%, DC - 17.2%, DD - 17.2%.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00015, REVISION 2

TABLE 1

WELD I.D.	CODE CATEGORY	ITEM NO.	DESCRIPTION OF EXAMINATION LIMITATION
Seam, AE	B-A	B1.30	The "AE" weld seam joins the no. 4 shell ring to the RPV flange. The physical configuration of the flange precludes complete examination coverage of the code-required volume. The code volume is examined with limitations from the shell side only, access from the flange side of the weld is totally progibited (see Figures 3 & 4). The following provides the details of the volumes examined compared to the code-required volume. Code Volume: 84.35 in^2 Weld Volume: 15.06 in^2 Examination Coverage Obtained:

	Code Volume (in^2)	% Examined	Weld Volume (in^2)	% Examined
0°	42.47	50.3	12.58	83.5
45° - T	66.56	78.9	14.04	93.2
60° - T	71.48	84.7	14.09	93.5
45° - P	42.47	50.3	12.58	83.5
60° - P	42.47	50.3	12.58	83.5

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00015, REVISION 2

TABLE 1

WELD I.D.	CODE CATEGORY	ITEM NO.	DESCRIPTION OF EXAMINATION LIMITATION
Nozzles; N4A, N4C, N4D, N4F	B-D	B3.90	The N4 nozzles are located on shell ring no. 3, 17" from the N13 nozzles. The close proximity of the N13 nozzles limits the automated examination to a "W" dimension of 14" for approximately 44° of the N4 nozzles circumference. This limitation prevents the 60° T-Scan from examining all of the required code volume (see Figure 5). Supplemental manual 60° examinations would obtain coverage of the limited area; however, due to the radiation levels encountered at the first refuel outage (3 R/hr) and the fact that the volume not examined by the 60° scan is examined by the 45° T-Scan, 45° and 60° P-Scan and the 0° scan, it is not practical to perform the supplemental examinations.
Nozzles; N2D, N2C, N2J, N2K	B-D	B3.90	Examination of 4 recirculation inlet nozzles is limited due to enterferences from the two N9 Jet Pump Instrument nozzles located approximately 14" from the affected N2's. This portion of the circumference that is not accessible to the automated scanner is examined manually, but the 14" limitation prevents complete coverage with the 60° T-Scan (see Figure 6).
Nozzles; N9A, N9B	B-D	B3.90	The two N9 nozzles are located between and just below four of the N2 nozzles creating the same limitations for the N9 nozzles as discussed above for the N2's (see Figure 7).

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00015, REVISION 2

TABLE 1

WELD I.D.	CODE CATEGORY	ITEM NO.	DESCRIPTION OF EXAMINATION LIMITATION
Nozzle to safe welds: N1A&B, N2A thru N2N, N4A thru N4F, N5A&B, N6A,B&C, N9A&B	B-F	B5.10	Due to the geometric configuration of the nozzle to safe end assembly, full code coverage cannot be obtained from two directions. Examinations are performed with either shear wave, refracted longitudinal wave, or both due to the complex bi- and trimatellic structurers of the nozzle to safe end assembly. Currently, examinations are performed utilizing automated systems, the coverage of an automated examination is more limiting than that of a manual examination. The coverage report provided in Figures 14 through 19 indicates the additional coverage that can be obtained in the event future examinations are performed with manual techniques.

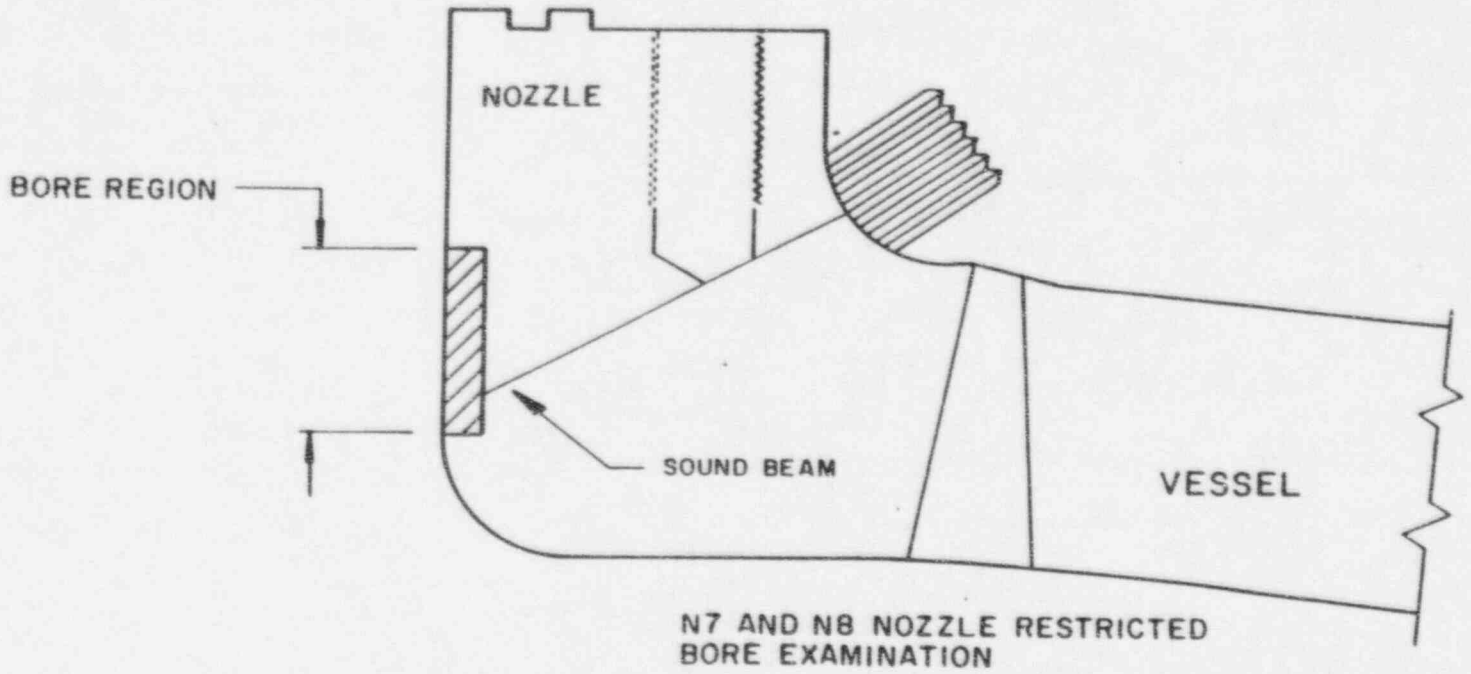


FIGURE 1
SCALE .4"=1.0"

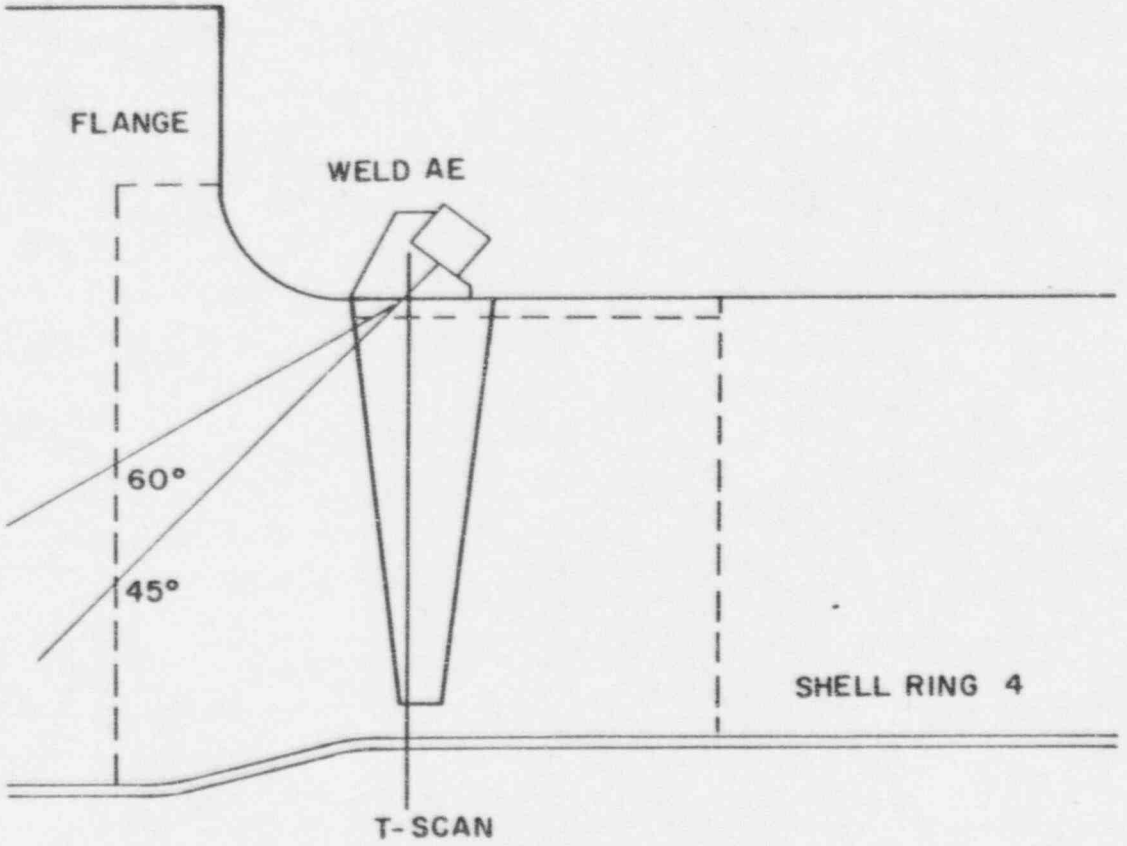


FIGURE 3

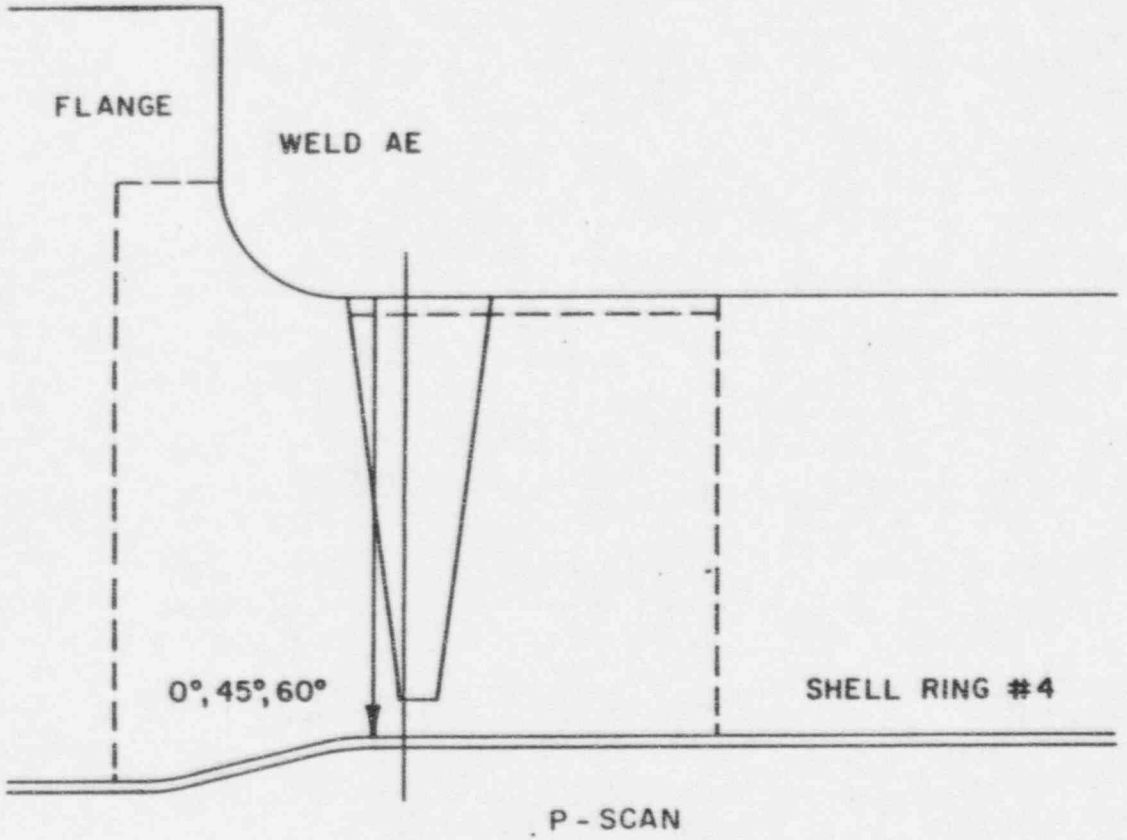
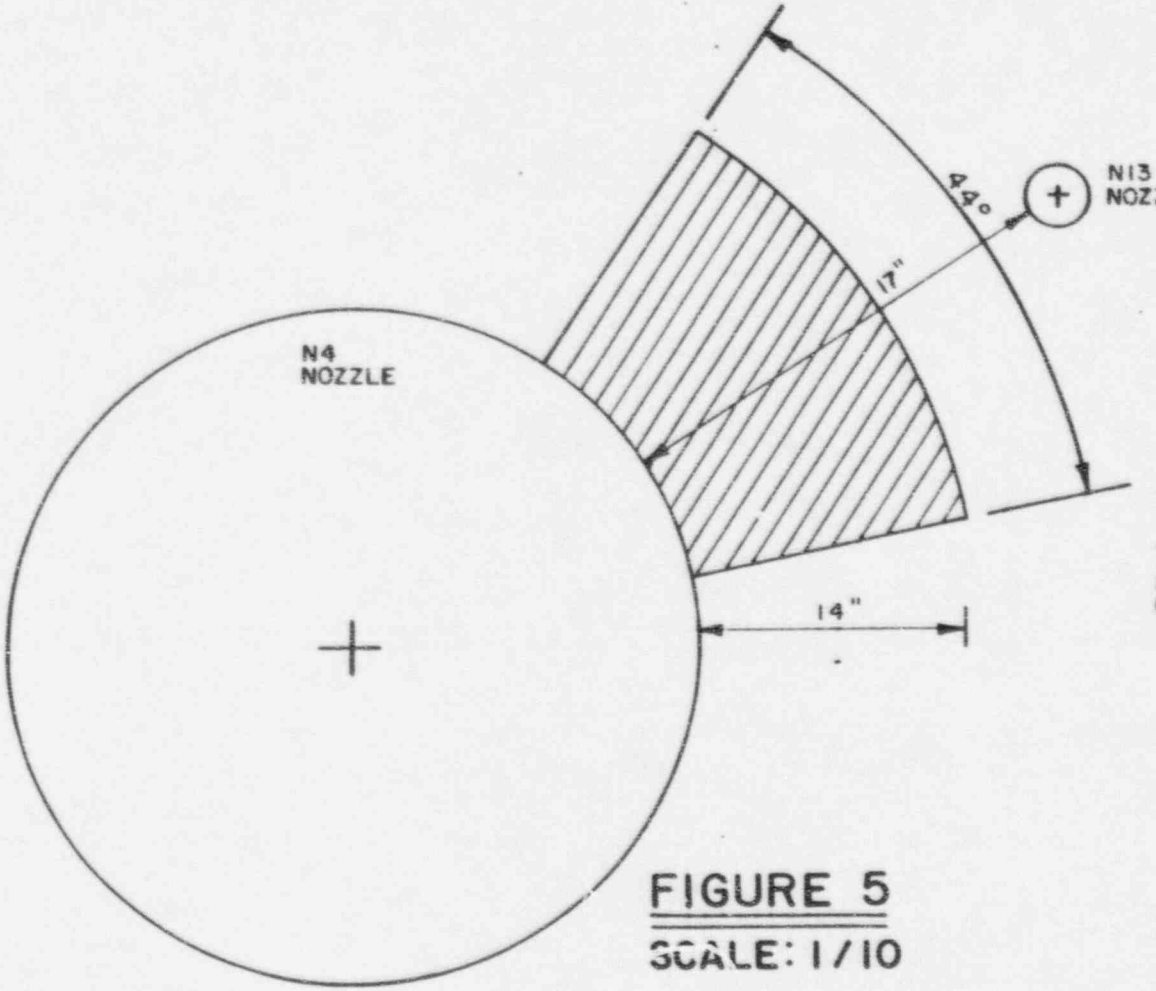


FIGURE 4.



THIS AREA IS LIMITED TO "W" OF 14" APPROX. 44° DUE TO THE LOCATION OF THE N13 NOZZLES

FIGURE 5

SCALE: 1/10

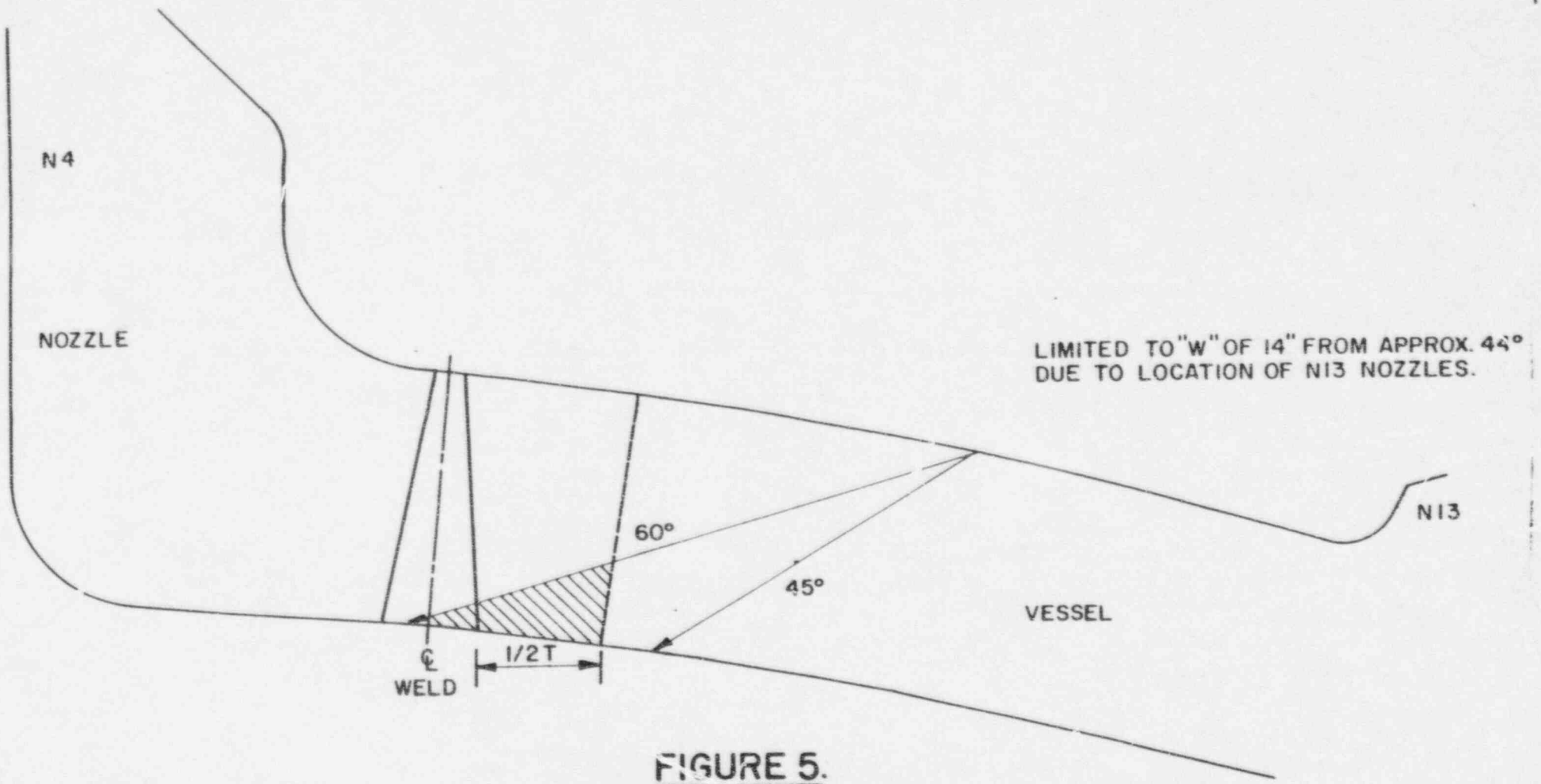


FIGURE 5.
SCALE 1/4

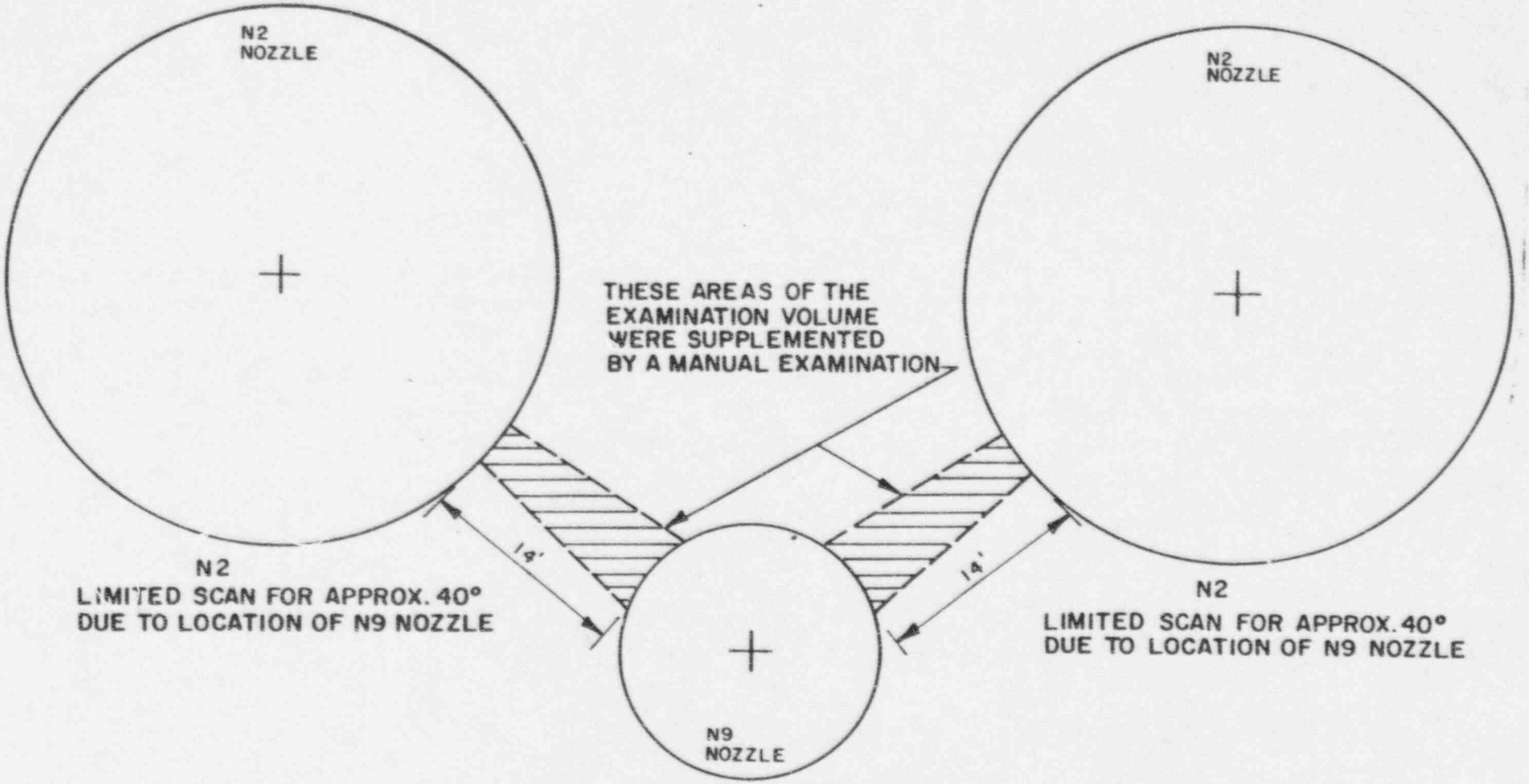


FIGURE 6

SCALE: 1/10

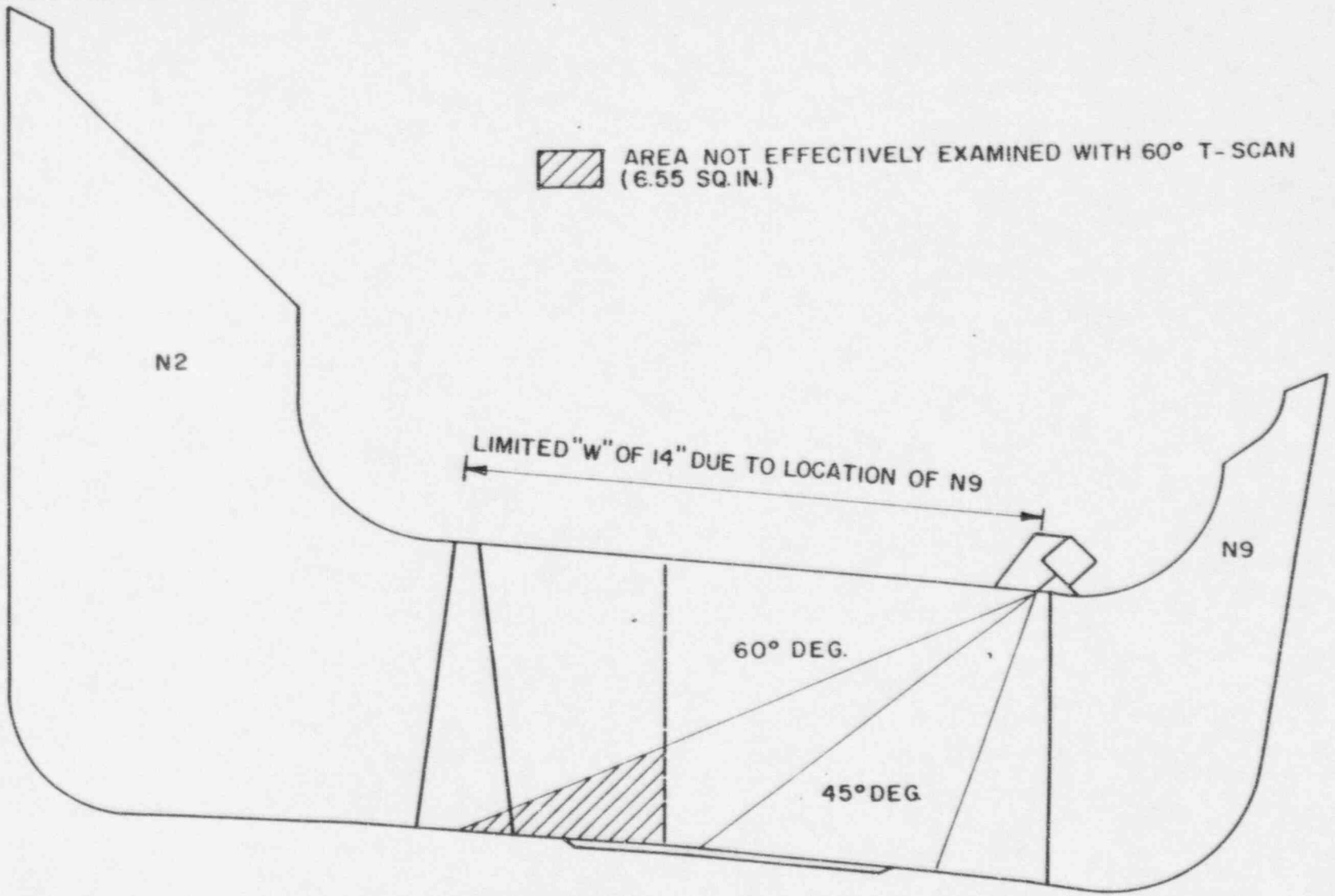


FIGURE 6.

PAGE 2 OF 2

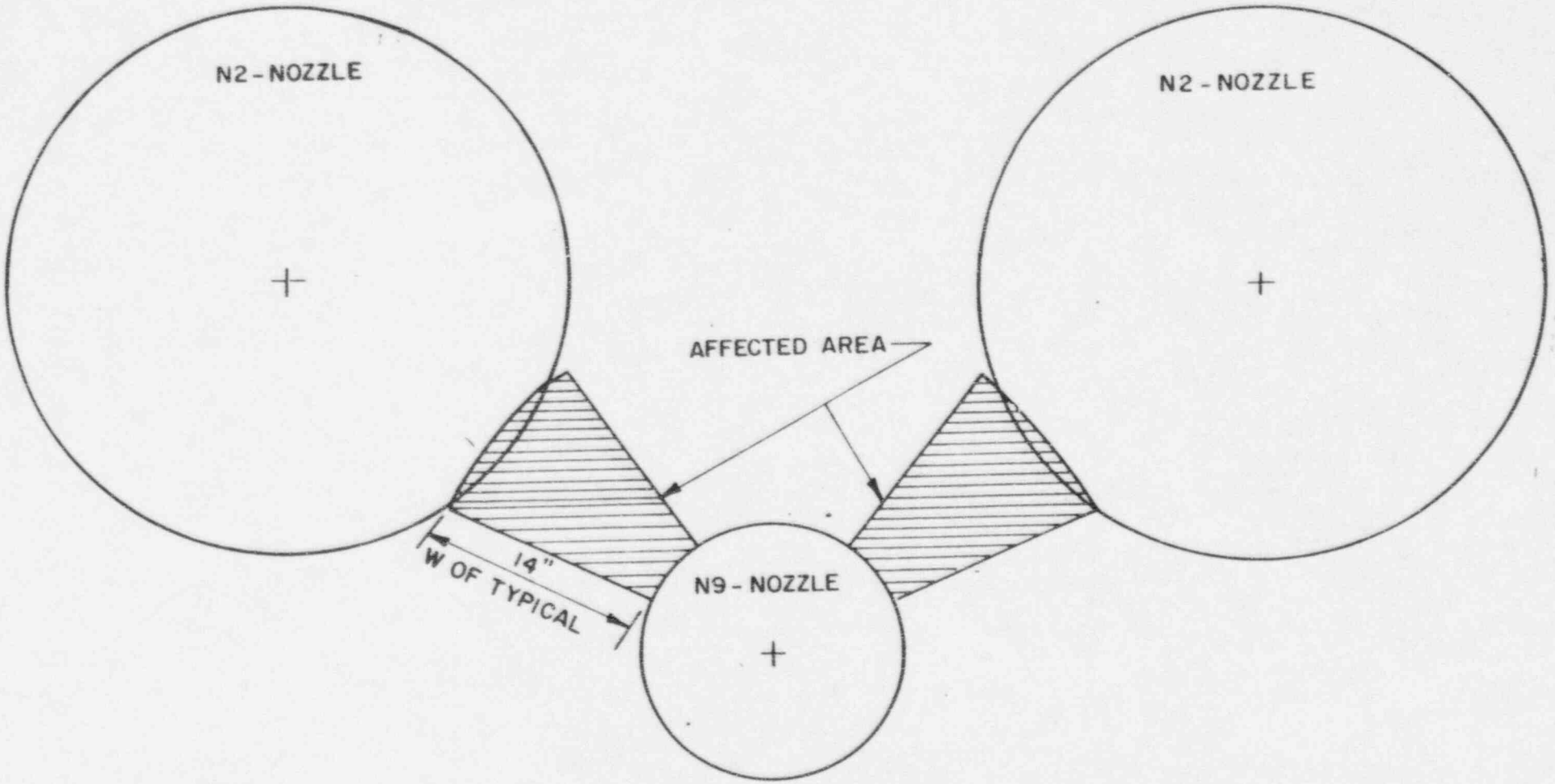


FIGURE 7.
SCALE: 1/10

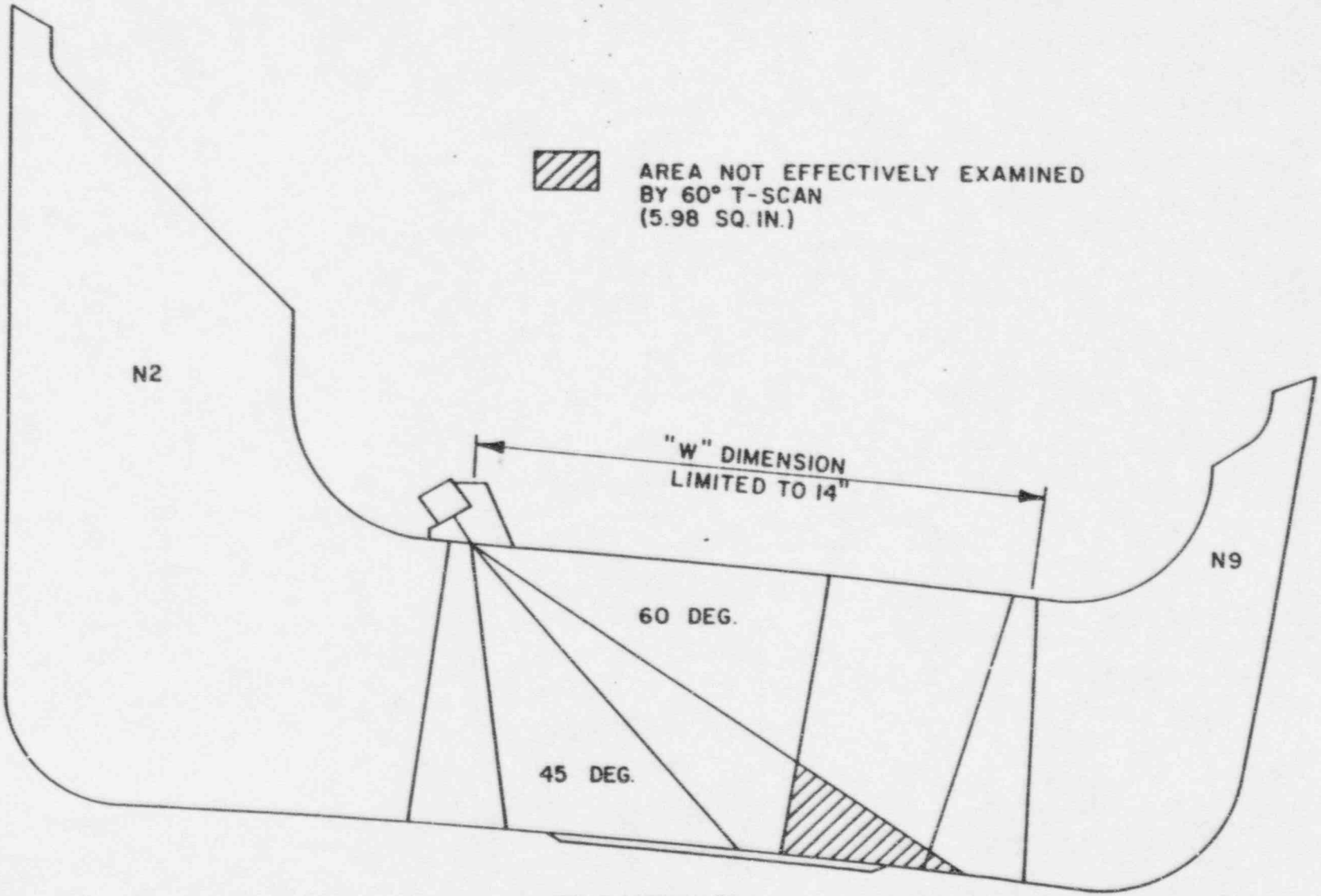
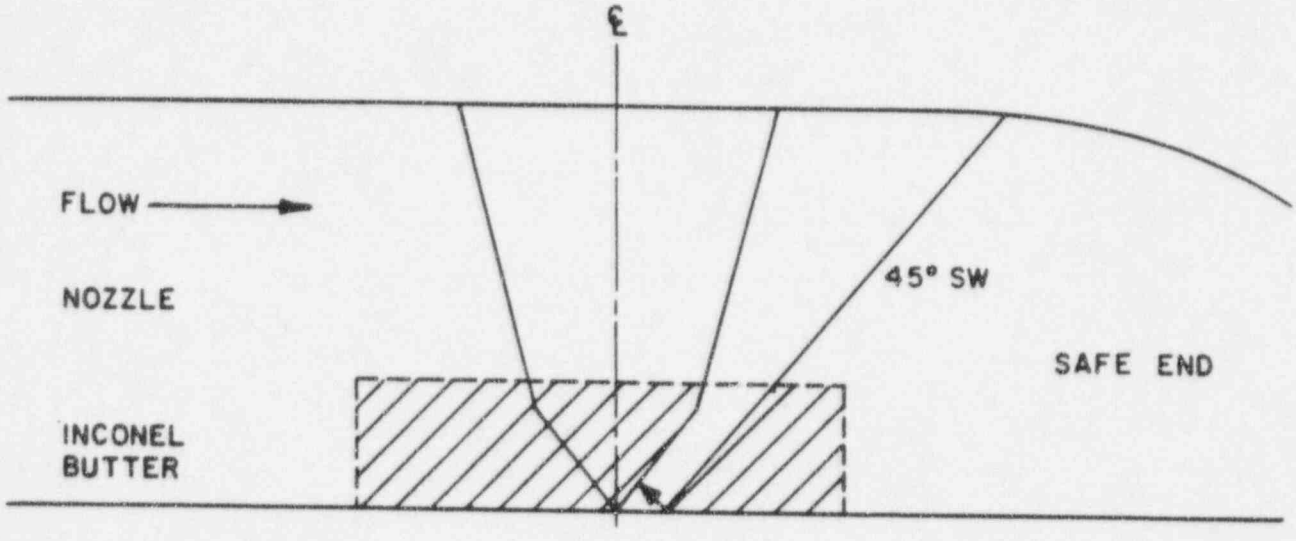

AREA NOT EFFECTIVELY EXAMINED
BY 60° T-SCAN
(5.98 SQ. IN.)
N2
"W" DIMENSION
LIMITED TO 14"
N9
60 DEG.
45 DEG.

FIGURE 7.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST NO. I-00015, REVISION 2

N1
RECIRCULATION OUTLET NOZZLE TO SAFE END WELD
LIMITATIONS



N1

Total code volume at a cross-sectional view is 0.95 in^2.

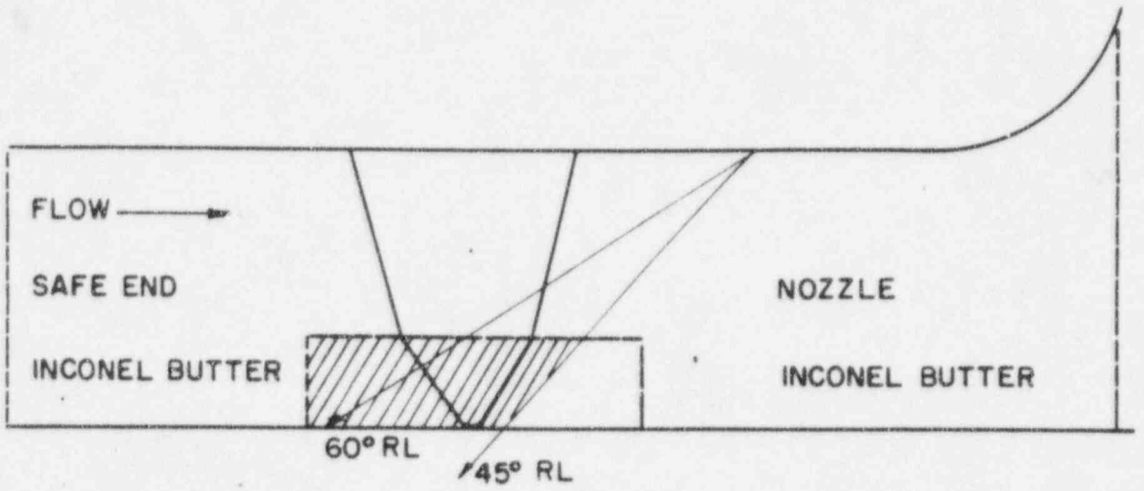
- Automated techniques utilizing a 45° shear wave obtains two-directional coverage of an area equal to 0.17 in^2.
- Also, a 45° and 60° refracted longitudinal (RL) wave is utilized that obtains one-directional coverage of the entire code volume scanning from the nozzle side.
- The cross-hatched area received the one-directional coverage from the nozzle side, the remaining area was examined from two directions utilizing the shear wave.
- Manual examinations will provide two-directional coverage of the weld and nozzle base material, the available "W" dimension on the safe end side of the weld is insufficient to obtain full coverage of the safe end material.

FIGURE 14

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST NO. I-00015, REVISION 2

N2
RECIRCULATION INLET NOZZLE TO SAFE END WELD
LIMITATIONS



N2

Total code volume at a cross-sectional view is 0.846 in^2.

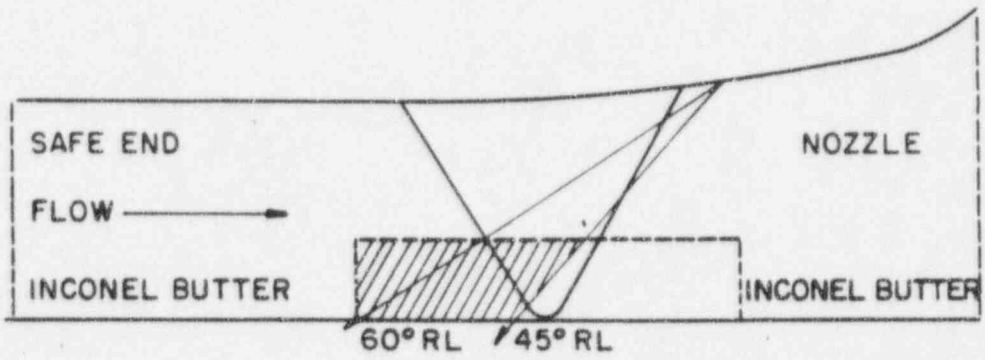
- Automated techniques utilized a 45° and 60° RL wave for the examination of the N2F and N2H to obtain complete code volume coverage from one direction with both angles.
- The remaining N2 nozzles (A, B, C, D, E, G, J, K, M, N) were examined completely from one direction with only the 60° due to excessive noise received with the 45° transducers.
- Manual examinations can provide two-directional coverage of the area represented by the cross-hatching, this would improve total code coverage to 0.271 in^2 or 32% for the 60° and 0.642 in^2 or 75.6% for the 45°.
- If the presently available 45° transducers are improved to reduce noise levels, future examinations will include the 45° for improved coverage.

FIGURE 15

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST NO. I-00015, REVISION 2

N4
FEEWATER INLET NOZZLE TO SAFE END WELD
LIMITATIONS



N4

Total code volume at a cross-sectional view is 0.70 in^2.

- Automated techniques utilizing a 45° and 60° RL wave obtained coverage of the code volume from one direction only (safe end side).

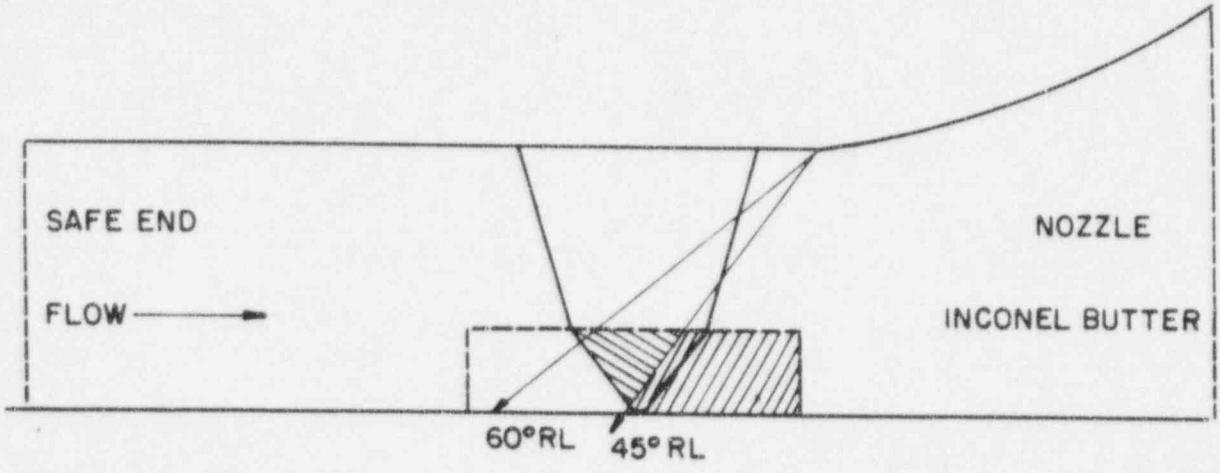
- Manual examinations will provide coverage from two directions for the area identified above by the cross-hatching, 0.36 in^2 or 51.4% of the total code volume.

FIGURE 16

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST NO. I-00015, REVISION 2

N5
CORE SPRAY TO SAFE END WELD
LIMITATIONS



N5
SCALE: 1" = 1"

Total code volume at a cross-sectional view is 0.72 in^2.

Automated techniques provide a 45° shear wave from the safe end side, obtaining two-directional coverage of an area equal to 0.33 in^2 or 46.6% of the total code volume.

Also, a 45° and 60° RL wave examination from the safe end side is performed, obtaining one-directional coverage of the total code volume. Area receiving examination from one direction only is 53.4% of the code volume.

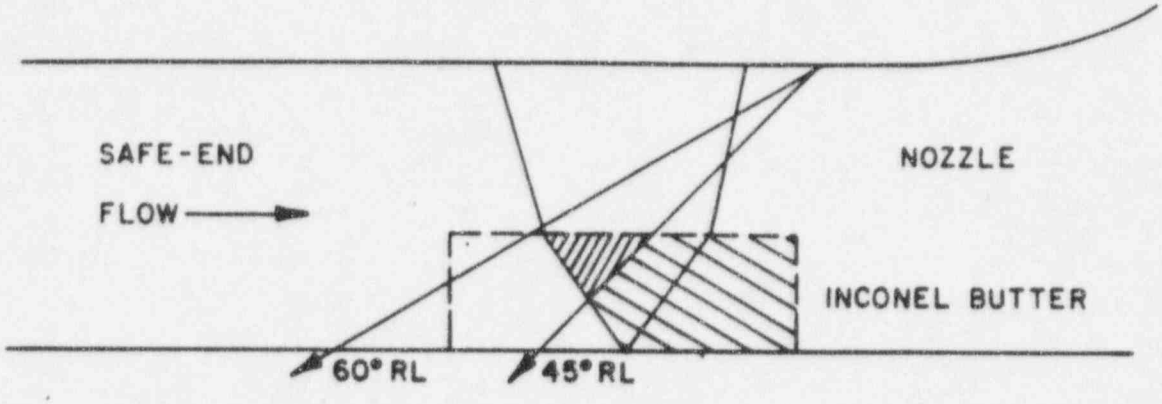
Manual examinations with RL wave will increase two-directional cover by 18%.

FIGURE 17

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST NO. I-00015, REVISION 2

N6
RESIDUAL HEAT REMOVAL / LOW PRESSURE CORE INJECTION
SAFE END TO NOZZLE WELD
LIMITATIONS



N6

Total code volume at a cross-sectional view is 0.93 in^2.

Automated techniques provide a 45° shear wave examination from the safe end side, obtaining two-directional coverage of 0.34 in^2 or 36.6% of the total code volume.

Also, 45° and 60° RL wave examinations performed from the safe end side obtain one-directional coverage of the total code volume; area receiving one-directional coverage only is 0.59 in^2 or 63.4% of the code volume.

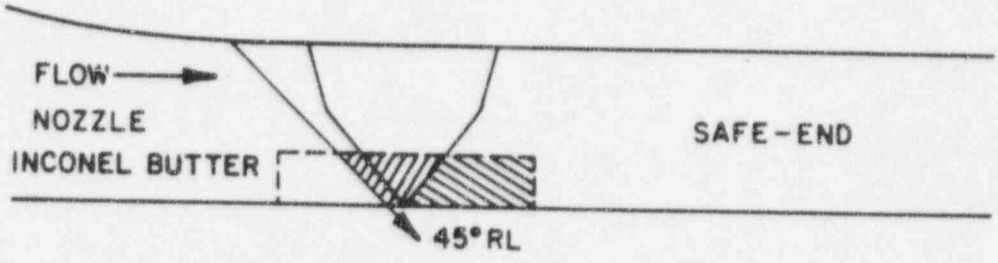
Manual examinations will increase two-directional coverage by 9.7% or 0.09 in^2.

FIGURE 18

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST NO. I-00015, REVISION 2

N9
JET PUMP INSTRUMENTATION NOZZLE TO SAFE END WELD



N9

Total code volume at a cross-sectional view is 0.29 in^2.

Automated techniques provide a 45° shear wave examination from the safe end side, obtaining two-directional coverage of 0.10 in^2 or 34.5% of the total code volume.

Also, 45° and 60° RL wave examinations performed from the safe end side obtain one-directional coverage of the total code volume; area receiving one-directional coverage only is 0.19 in^2 or 65.5% of the total code volume.

Manual examinations will increase two-directional coverage by 27.5% or 0.08 in^2.

FIGURE 19

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00017, REVISION 1

PRESSURE TESTING
OF CATEGORY CH PRESSURE RETAINING COMPONENTS

DELETED

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00018, REVISION 2

PRESSURE TESTING
OF CATEGORY B-P PRESSURE RETAINING COMPONENTS

I. Component:

Class 1 pressure retaining components, Examination Category B-P (see table 1).

II. Code:

The pressure retaining components within this category are designed and fabricated to ASME Section III, class 1 requirements. Applicable inservice inspections are performed in accordance with ASME Section XI, 1977 Edition through and including the Summer 1979 Addenda.

III. Code Requirements:

Class 1 pressure retaining components, category B-P, are required to receive a system leakage test (IWB-5221) each refueling outage, and a system hydrostatic test (IWB-5222) or a leakage test (ASME Code Case N-498-1) each inspection interval.

IV Information to support the determination that the code requirements are impractical:

ASME Section XI, 1977 Edition, Summer 1979 Addenda, Table IWB-2500-1, category B-P, note 1, requires the test boundary for both the system leakage and the hydrostatic test to include the entire reactor coolant system. This boundary, as defined, requires portions of piping to be pressure tested that are isolated by normally closed valves. To accomplish testing of the isolated piping, extensive efforts are required that may include the installation of mechanical jumpers, initiation of false signals to open valves or the erection of independent water and pressure sources. Later editions of ASME Section XI have redefined the test boundary for the system leakage test.

Note 1 of IWB-2500-1, Category B-P has been revised to address only the system leakage test and to redefine the test boundary as:

"The pressure retaining boundary during the system leakage test shall correspond to the reactor coolant system, with all valves in the normal position, which is required for normal reactor operation startup. The VT-2 examination shall, however, extend to and include the second closed valve at the boundary extremity."

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00018, REVISION 2

PRESSURE TESTING
OF CATEGORY B-P PRESSURE RETAINING COMPONENTS

V. Specific Relief Requested:

With the use of ASME Section XI Code Case N-498-1, there are two distinct leakage tests. The system leakage test performed at each refuel outage (Category B-P. Items B15.50, B15.60, and B15.70), and the system leakage test (Code Case N-498-1) performed as an alternative to the hydrostatic test performed at the end of the interval.

For those system leakage tests performed at each refuel outage, permission is requested to establish the Class 1 pressure test boundary to the requirements of ASME Section XI, 1983 Edition, Summer 1983 Addenda, Table IWB-2500-1, Category B-P, Note 1. System leakage tests performed to the requirements of Code Case N-498-1 as an alternate to the interval hydrostatic test will be performed using the test boundaries as described by the Code Case. Table 1 lists the portions of systems that are examined by the VT-2 method, but excluded from pressurization during the refuel outage system leakage test.

VI. Reasons why relief should be granted:

Request for altering the Class 1 refuel outage system leakage test pressurization boundaries should be granted for the following reasons:

1. All components excluded from pressurization during the system leakage test are designed, fabricated, installed and tested to the requirements of ASME Section III, Subsection NB (Class 1).

2. The components excluded from pressurization during the refueling outage system leakage test are subjected to pressurization during the interval system leakage test with hold times meeting those required for a hydrostatic test.

3. DELETED

4. This request for relief, if approved, would be consistent with the current NRC approved edition of ASME Section XI (1983 Edition, Summer 1983 Addenda).

VII. Alternate Testing:

None

GRAND GULF NUCLEAR STATION
UNIT 1
RELIEF REQUEST I-00018, REVISION 2

PRESSURE TESTING
OF CATEGORY B-P PRESSURE RETAINING COMPONENTS

TABLE 1

ITEM	SYSTEM	LINE CLASS	DESCRIPTION
1	B21	1" DBA-87	LINE DOWNSTREAM OF Q1B21-F136B
2	B21	1" DBA-87	LINE DOWNSTREAM OF Q1B21-F136A
3	B33	2" DCA-24	LINE DOWNSTREAM OF Q1B33-F051A
4	B33	2" DBA-42	LINE DOWNSTREAM OF Q1B33-F029
5	B33	2" DCA-24	LINE DOWNSTREAM OF Q1B33-F051B
6	C41	1 1/2" DCA-3	LINE DOWNSTREAM OF Q1C41-F219
7	C41	3/4" DCA-33	LINE DOWNSTREAM OF Q1C41-F219
8	C41	1" DCA-31	LINE DOWNSTREAM OF Q1C41-F210
9	C41	1 1/2" DCA-2	LINE UPSTREAM OF Q1C41-F222
10	C41	1" DCA-34	LINE UPSTREAM OF Q1C41-F222
11	C41	3/4" DCA-4	LINE UPSTREAM OF Q1C41-F222
12	C41	1" DCA-34	LINE DOWNSTREAM OF Q1C41-F218
13	C41	3/4" DCA-4	LINE DOWNSTREAM OF Q1C41-F026
14	E12	6" DBA-32	LINE UPSTREAM OF Q1E51-F066
15	E12	1" DBA-80	LINE UPSTREAM OF Q1E51-F066
16	E12	1" DBA-80	LINE DOWNSTREAM OF Q1E12-F344
17	E12	14" DBA-28	LINE UPSTREAM OF Q1E12-F041B
18	E12	1" DBA-81	LINE UPSTREAM OF Q1E12-F041B
19	E12	1" DBA-81	LINE DOWNSTREAM OF Q1E12-F236
20	E12	20" DBA-64	LINE DOWNSTREAM OF Q1E12-F009
21	E12	14" DBA-29	LINE UPSTREAM OF Q1E12-F041A
22	E12	1" DBA-4	LINE DOWNSTREAM OF Q1E12-F223
23	E12	12" DBA-38	LINE UPSTREAM OF Q1E12-F041C
24	E12	1" DBA-79	LINE UPSTREAM OF Q1E12-F041C

GRAND GULF NUCLEAR STATION
UNIT 1
RELIEF REQUEST I-00018, REVISION 2

PRESSURE TESTING
OF CATEGORY B-P PRESSURE RETAINING COMPONENTS

TABLE 1

ITEM	SYSTEM	LINE CLASS	DESCRIPTION
25	E12	1" DBA-79	LINE DOWNSTREAM OF Q1E12-F234
26	E21	14" DBA-1	LINE UPSTREAM OF Q1E21-F006
27	E21	1" DBA-31	LINE UPSTREAM OF Q1E21-F006
28	E21	1" DBA-31	LINE DOWNSTREAM OF Q1E21-F207
29	E22	12" DBA-5	LINE DOWNSTREAM OF Q1E22-F005
30	E22	14" DBA-5	LINE UPSTREAM OF Q1E22-F005
31	E22	1" DBA-78	LINE UPSTREAM OF Q1E22-F005
32	E22	1" DBA-78	LINE DOWNSTREAM OF Q1E22-F218
33	E38	1 1/2" DBA-87	LINE UPSTREAM OF Q1E38-F002A
34	E38	1 1/2" DBA-87	LINE UPSTREAM OF Q1E38-F002B
35	E51	10" DBA-24	LINE DOWNSTREAM OF Q1E51-F063
36	E51	1" DBA-34	LINE DOWNSTREAM OF Q1E51-F076
37	G33	6" DBA-86	LINE DOWNSTREAM OF Q1G33-F250
38	G33	1" DBA-86	LINE DOWNSTREAM OF Q1G33-F241
39	G33	3/4" DBA-82	LINE DOWNSTREAM OF Q1G33-F002

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00019, REVISION 1

INSERVICE EXAMINATION
OF REACTOR PRESSURE VESSEL ITEMS

I. Component:

Inaccessible portions of the Reactor Pressure Vessel (RPV) as listed below.

1. Jet Pump Instrument Nozzles (N9 A&B), safe end to penetration seal welds (see Figure 1).

2. RPV flange stud hole ligament areas (see Figure 2).

II. Code:

1. The Jet Pump Instrument Nozzle assemblies were designed and fabricated to ASME Section III, Class 1 requirements. Applicable inservice inspections are to be performed in accordance with the ASME Section XI, 1977 Edition through and including the Summer 1979 Addenda, Table IWB-2500, Category B-J.

2. The RPV flange assembly is designed and fabricated to ASME Section III, Class 1 requirements. Applicable inservice inspections are to be performed in accordance with the ASME Section XI, 1977 Edition through and including the Summer 1979 Addenda, Table IWB-2500, Category B-G-1.

III. Code requirements:

1. ASME Section XI, Table IWB-2500, Category B-J, requires the safe end to penetration seal weld to be volumetrically and surface examined. The examinations are to be performed once each inspection interval.

2. ASME Section XI, Table IWB-2500, Category B-G-1, requires the threads in the RPV flange stud hole, and one inch of base material around the stud hole, to be volumetrically examined for a depth equal to the diameter of the stud. The examinations are to be performed once each inspection interval.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00019, REVISION 1

INSERVICE EXAMINATION
OF REACTOR PRESSURE VESSEL ITEMS

IV. Information to support the determination that the code requirements are impractical:

1. The welds requiring relief attach the penetration seal to the safe end. The penetration seal is a forged item allowing 14 socket-welded connections for each of the two N9 nozzles. The configuration of the penetration seal and the installing weld limits the access required for obtaining full code coverage of the weld and associated base material.

   The weld is volumetrically examined from the safe end, obtaining 44.7% coverage of the code volume. Examination from the weld and from the penetration seal side of the weld is prohibited due to component configuration and weld geometry (see Figure 1).

2. The area of the RPV flange requiring relief is located between the stud hole and the RPV inside diameter (ligament area). The ligament area also contains the sealing surface that makes contact with the RPV head flange. The seal surface is comprised of deposited weld material, and raised approximately ½" above the flange face creating a geometrical obstruction.

   A code volume of 96% is volumetrically examined without interference with the seal surface. The remaining 4% is contained within the restricted area associated with the seal surface (see Figure 2).

V. Specific relief requested:

Permission is requested to perform the code-required volumetric examinations to the extent described above and shown in Figures 1 and 2.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00019, REVISION 1

INSERVICE EXAMINATION
OF REACTOR PRESSURE VESSEL ITEMS

VI. Reasons why relief should be granted:

Request for permission to limit the code-required examination to the accessible areas should be granted for the following reasons:

1. N9 NOZZLE TO PENETRATION SEAL

   a. The subject welds were installed, radiographed, surface examined, and hydrostatically tested to the requirements of ASME Section III, Class 1.

   b. The subject welds are completely surface examined during inservice activities once each inspection interval.

   c. The welds are subject to a pressure test in accordance with ASME Section XI, Table IWB-2500-1, and ASME Section XI Code Case N-498-1.

   d. The safe end material is SA 336-F8 (304) stainless steel, and the penetration seal is 304L stainless steel. Due to the geometric configuration of the weld joint, the examination can only be conducted from the safe end side of the joint, and therefore, does not obtain full coverage. The examination is able to obtain 44.7% of the code-required volume. The examineable area includes the inside surface of the safe end (304 stainless steel material) including the heat-affected zone.

      The primary degradation mechanism at this location is intergranular stress corrosion cracking (IGSCC). Fatigue is not a significant factor due to the limited fatigue loading at this location. Therefore, the potential for cracking at this location should consider IGSCC only. The occurrence of IGSCC is caused by the simultaneous presence of three factors:

      1) high stress,

      2) aggressive environment, and

      3) susceptible material.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00019, REVISION 1

INSERVICE EXAMINATION
OF REACTOR PRESSURE VESSEL ITEMS

The safe end and penetration seal side of the weld both see essentially the same stress and environmental conditions. However, there is a significant difference in material susceptibility between the 304 SS safe end and the 304L penetration seal. Generic Letter 88-01, NUREG 0313, Revision 2, recognizes 304L type materials as being IGSCC resistant. The 304 portion of the assembly including that side of the weld root is examined from one direction utilizing IGSCC techniques and qualified personnel. In addition, Generic Letter 88-01 excludes all piping smaller than 4" in nominal diameter. The N9 A&B safe ends are less than 4" in nominal diameter; therefore, under the rules of the generic letter, the safe ends are not susceptible to IGSCC.

e. The accessible portions of the subject welds will be volumetrically examined and the complete weld and adjacent base material will be surface examined in accordance with ASME Section XI. Should indications be found, an engineering evaluation will be made to determine if the inaccessible portions of the subject welds have been affected.

f. Any leakage occurring from the N9 nozzles would be detected by the existing leakage detection system.

g. Mechanical preparation of the weld would allow additional coverage to be obtained by facilitating transducer placement on top of the weld. The efforts necessary for obtaining the improved coverage would require a man rem expenditure of approximately 21.2 whole body and 37.2 for the extremities. The total man rem exposure required to obtain the additional examination coverage is not justified based on the low probability of IGSCC occurrence and the limited fatigue loading at the subject welds.

h. Examination history at GGNS has not recorded any flaws or evidence of service induced degradation in category B-J welds.

i. The limited examination of the two N9 nozzles (A&B) is considered to be sufficient to determine the structural integrity of welded assemblies.

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00019, REVISION 1

INSERVICE EXAMINATION
OF REACTOR PRESSURE VESSEL ITEMS

2. RPV FLANGE STUD HOLE

a. The RPV flange was fabricated as part of the RPV assembly and tested to the requirements of ASME Section III, Class 1.

b. The RPV, including the flange assembly, is subject to a pressure test in accordance with ASME Section XI, Table IWB-2500-1, and ASME Section XI Code Case N-498-1.

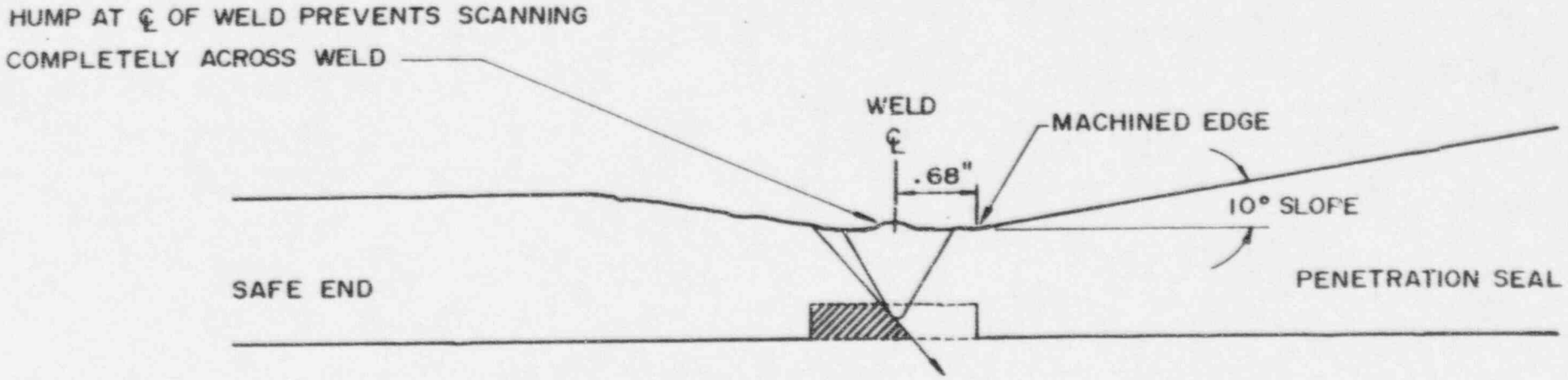
c. The entire code volume around the stud hole is examined except for the area associated with the sealing surface. This area is examined for a distance of ½" from the stud hole before interference from the seal surface is encountered. With the RPV head in place and fastened with the studs to the RPV shell flange, the seal surface and underlying material is subjected to compressional loads. The material in the vicinity of the threads or adjacent to the stud hole is subjected to shear loading with the head in place. Therefore, the limiting location with respect to applied stress is the material nearest the stud hole threads. Since this limited area is examined, any anticipated flaw initiation will be detected.

d. The amount of obtained volumetric coverage that includes the bounded area is adequate to ensure structural integrity of the stud hole regions of the RPV flange.

VII. Alternative testing:

None

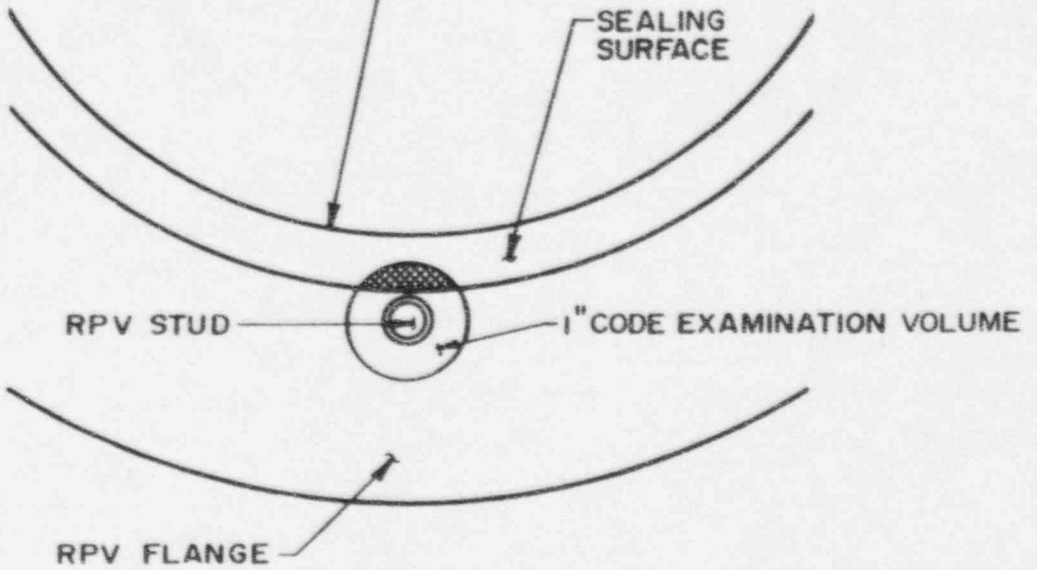
N9 A & B
SAFE END TO PENETRATION SEAL
44.7% EXAMINED IN ONE DIRECTION



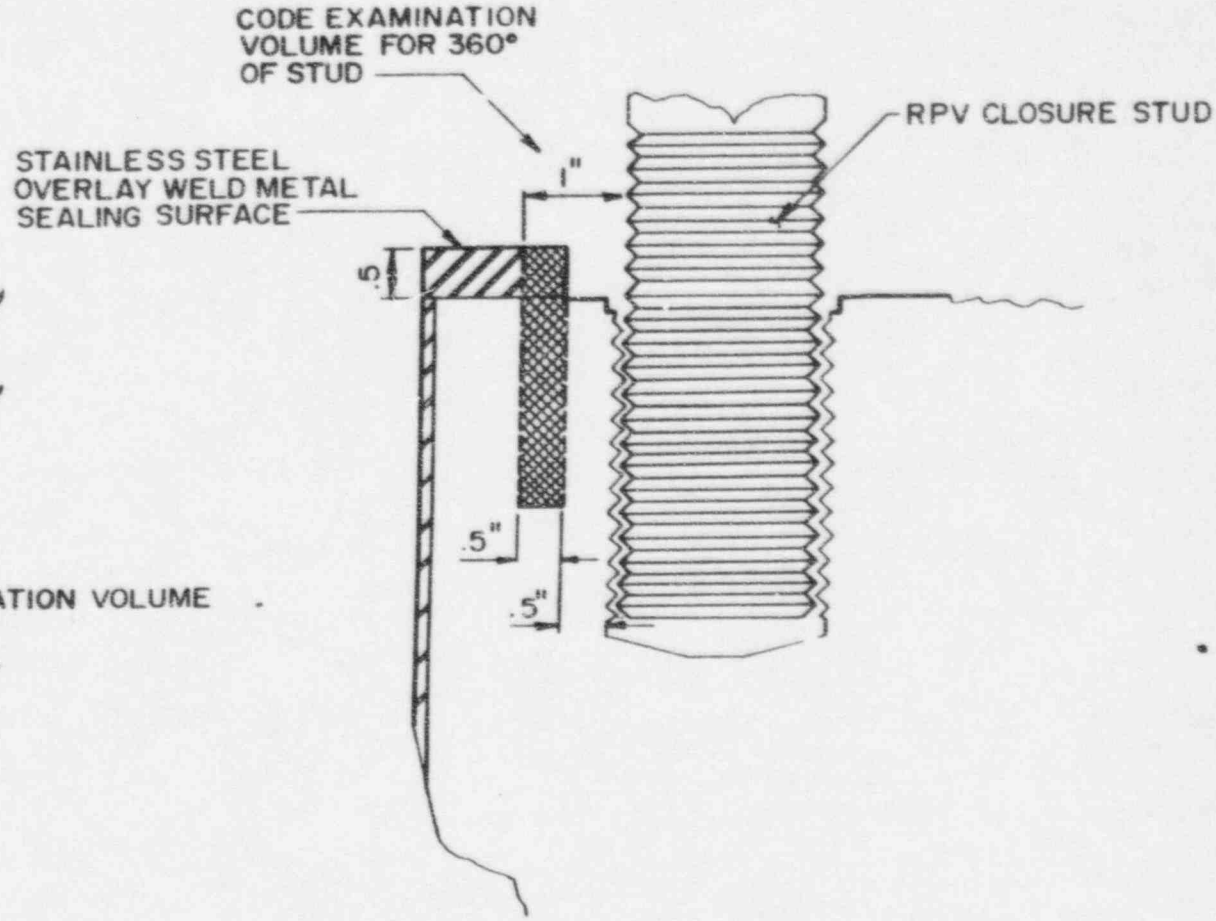
CODE VOLUME FOR VOLUMETRIC EXAMINATION = .228 IN^2

EXAMINABLE VOLUME FOR VOLUMETRIC EXAMINATION = .102 IN or 44.7 %

FIGURE 1



TOP VIEW OF SHELL FLANGE



CROSS SECTION VIEW OF RPV FLANGE

UNABLE TO SCAN FULL 1" CIRCLE AROUND STUD HOLE

FIGURE 2

GRAND GULF NUCLEAR STATION
UNIT 1

RELIEF REQUEST I-00024, REVISION 0

INSERVICE INSPECTION
OF CLASS 1 PUMP AND VALVE INTERNAL SURFACES

I. Component:

Class 1 pumps and valves, examination Category B-L-2 and B-M-2.

II. Code:

The pumps and valves addressed by these examination categories are designed and fabricated as Section III, Class 1 pressure retaining components.

III. Code requirements:

ASME Section XI, 1977 Edition through the Summer 1979 Addenda, IWB-2500 requires examination of the internal surfaces of one pump and one valve from each group of pumps/valves performing similar functions in the system.

IV. Information to support the determination that the code requirements are impractical:

Affected components have shown good reliability in service. Significant man-hours are required to perform disassembly of pumps/valves. Additionally the expenditure of man-Rem is high. Disassembly of pumps and valves solely for the purpose of visual examination is inconsistent with ALARA concerns and poses an excessive burden with no compensating increase in quality or safety. Later editions of ASME Section XI incorporate provisions requiring examination only if components are disassembled for maintenance, repair, or volumetric examination. These Code requirements are contained in Code Year and addenda that have been endorsed for use in 10CFR50.

V. Specific relief requested:

Permission is requested to allow performance of pump/valve internal examination in accordance with the requirements of Table IWB-2500-1, Examination Categories B-L-2 and B-M-2 contained in the 1989 Edition of the ASME Code. Note 2 to this table states: "Examination is required only when a pump or valve is disassembled for maintenance, repair, or volumetric examination. Examination of the internal pressure boundary shall be performed to the extent practicable. Examination is required only once during the inspection interval."